GeoStrategies Inc.
Environmental Consulting,
Engineering and Geologic Services

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Letter of Transmittal

Date: 11/19/92

From: ROBERT MALLORY
Project No: 7909

To: MS. SUSAN HUGO (CERTIFIED MAIL)
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OAKLAND, CA. 94621

Subject: QUARTERLY MON./WELL INSTAL. REPORT
ARCO SS# 4931
731 WEST MacARTHUR BLVD.
OAKLAND, CA.

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GeoStrategies Inc.

QUARTERLY MONITORING/WELL INSTALLATION REPORT - Third Quarter 1992

ARCO Service Station No. 4931
731 West MacArthur Boulevard
Oakland, California

790901-19

November 13, 1992

GeoStrategies Inc.
2140 WEST WINTON AVENUE
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November 13, 1992

ARCO Products Company
P.O. Box 5811
San Mateo, California 94402

Attn: Mr. Michael Whelan

Re: QUARTERLY MONITORING/WELL INSTALLATION REPORT - Third Quarter 1992
ARCO Service Station No. 4931
731 West MacArthur Boulevard
Oakland, California

Gentlemen:

INTRODUCTION

This Quarterly Monitoring/Well Installation Report was prepared by GeoStrategies Inc. (GSI) and presents third quarter, 1992 ground-water sampling results and well installation activities for the above referenced location (Plate 1). Four exploratory borings were drilled on June 15 and 16, 1992 and completed as ground-water monitoring wells A-13 and recovery wells AR-1 through AR-3. Groundwater monitoring well A-13 was installed to further delineate the up-gradient extent of petroleum hydrocarbons. Groundwater recovery wells AR-1 through AR-3 were installed to enhance the remediation of petroleum hydrocarbons in groundwater. Well locations are shown on Plate 2. Site monitoring wells and recovery wells were sampled for the third quarter, 1992 by the ARCO contractor on July 29 and 30, 1992. Field work was performed to comply with current State of California Water Resources Control Board (SWRCB) and local agency guidelines. Field Methods and Procedures were presented in the GSI Quarterly Monitoring Report dated October 4, 1990.

SITE BACKGROUND

There are currently twelve monitoring wells (A-2 through A-13) and three recovery wells (AR-1 through AR-3) at the site. These wells were installed between 1982 and 1992 by Groundwater Technology, Inc., Pacific Environmental Group, and GSI. Wells A-2 through A-10 and AR-1 through AR-3 are on-site and Wells A-11, A-12, and A-13 are off-site. These wells were installed to evaluate the horizontal and vertical extent of petroleum hydrocarbons in groundwater beneath the site.

Quarterly monitoring and sampling of site wells began in 1989. Groundwater samples have been analyzed for Total Petroleum Hydrocarbons calculated as Gasoline (TPH-Gasoline) according to EPA Method 8015 (Modified) and Benzene, Toluene, Ethylbenzene, and Xylenes (BTEX) according to EPA Method 8020. The ground-water samples collected from Well A-2 were analyzed for Total Oil and Grease (TOG) and Organic Lead during the first quarter, 1992 sampling event.

Between November, 1991 and April, 1992 the underground storage tanks at the site were removed and replaced. Soil samples were collected and the tank removal was observed by ROUX Associates (ROUX). The former tank complex was composed of two single-wall steel 8,000 gallon tanks and one single-wall steel 6,000 gallon tank, and one 12,000 gallon fiberglass tank. The present tank complex is composed of four double wall fiberglass 10,000 gallon tanks. The location of the former and present tank complexes are shown on Plate 2.

The ROUX report indicated that petroleum hydrocarbons had impacted the soil in the vicinities of the tank complex and product lines. Soils in both locations were overexcavated and resampled. Soil samples from the perimeter of the tank complex overexcavation reported TPH-Gasoline at levels ranging from ND to 250 ppm. TPH-Gasoline results for soil samples from the product line overexcavation ranged from ND to 400 ppm. Soil from this area was excavated to the furthest extent possible without undermining site structures. Highest concentration (250 ppm) of TPH-Gasoline from soil not excavated was reported from the west wall of the former tank complex. A report documenting the tank removal was issued by ROUX on July 20, 1992. Gettler-Ryan Inc. (G-R) installed a passive product skimmer in Well A-8 during the second quarter 1992.

WELL INSTALLATION FIELD ACTIVITIES AND PROCEDURES

Four exploratory borings were drilled on June 15 and 16, 1992, using a truck-mounted, hollow-stem auger drilling rig. Borings A-13 and AR-1 through AR-3 were drilled to total depths of 30.0 feet below grade. Soil samples were collected at five-foot intervals using a modified California split-spoon sampler fitted with stainless steel sample tube liners. A GSI geologist observed the drilling, described the soil samples using the Unified Soil Classification System and Munsell Soil Color Chart, and prepared a lithologic log for each boring. Exploratory boring logs are presented in Appendix A.

Soil Sampling

An Organic Vapor Monitor (OVM) photoionization detector was used to perform head-space analysis on soils from each sampled interval, to test for the presence of Volatile Organic Compounds (VOCs) in the soil. These field procedures are performed and recorded as reconnaissance data and GSI does not consider these field screening techniques to be verification of contamination. Head-space analysis results are presented on each boring log in Appendix A.

Soil samples retained for chemical analyses were collected in clean stainless steel liners and sealed on both ends with aluminum foil and plastic end caps. Samples were labeled, entered onto a Chain-of-Custody form, and transported in a cooler with blue ice to Sequoia Analytical (Sequoia), a State-certified environmental laboratory located in Redwood City, California.

Monitoring Well Installation

Boring A-13 was drilled using 10-inch-diameter hollow stem augers and Well A-13 was installed to a depth of 30 feet below existing ground surface. The well was constructed using 3-inch-diameter Schedule 40 PVC well casing with 0.020-inch machine-slotted well screen. Well screen extends from 10 to 30 feet below grade. Lonestar #2/12 graded sand was placed in the annular space across the entire screened interval and extends two-feet above the top of the well screen. A one-foot thick bentonite seal was placed above the sandpack and then hydrated with clean water. A neat cement seal was placed from the top of the bentonite seal to approximately 1.0-foot below ground surface. A traffic-rated underground vault box, set in concrete, was installed over the top of the well, and a waterproof locking well cap and lock was placed on the well casing.

Recovery Well Installation

Borings AR-1, AR-2, and AR-3 were drilled using 8-inch-diameter and 12-inch-diameter hollow-stem augers to depths of 30 feet below ground surface. Recovery wells AR-1, AR-2, and AR-3 were installed to depths of 30, 28, and 30 feet below grade, respectively. Boring AR-2 was backfilled with native material to a depth of 28 feet. Recovery wells AR-1 and AR-2 were constructed using 6-inch-diameter Schedule 40 PVC blank well casing and 0.020-inch continuous wrap, carbon steel well screen. Recovery well AR-3 was constructed using 4-inch-diameter Schedule 40 PVC blank well casing and 0.020-inch continuous wrap, carbon steel well screen. Well screen extends from 8 to 28 feet below grade in Well AR-3 and from 10 to 30 feet below grade in Wells AR-1 and AR-2. Lonestar #2/12 graded sand was placed across the entire screened interval and extends one-foot above the top of each well screen. A one-foot thick bentonite seal was placed above the sandpack and then hydrated with clean water. A neat cement seal was placed from the top of the bentonite to approximately 1.0-foot below ground surface. A waterproof underground vault box was installed over the top of each well and a waterproof locking well cap and lock were placed on the well casing. Well completion details are presented with the Exploratory Boring Logs in Appendix A.

HYDROGEOLOGIC CONDITIONS

Regional Setting

The site is located in Oakland, California at the base of the Berkeley Hills approximately 1.5 miles east of the San Francisco Bay. The site is situated on alluvial-fan deposits of the Temescal Formation comprised of interfingering lenses of clayey gravel, sandy silty clay, and sand-clay-silt mixtures (Radbruch, D.H., 1957). Local topography suggests ground-water flows to the west toward San Francisco Bay.

Local Setting

Based on exploratory boring data, the local subsurface lithology appears to consist of clay, silt, and interbedded sand and gravel to the total depth explored of 30.0 feet below ground surface. Clay and silt were observed in Borings AR-1 and A-13 from ground surface to between 15 (A-13) and 17 (AR-1) feet below grade. Boring AR-2 was drilled through the former tank complex and encountered backfill gravel to a depth of 15 feet below ground surface. Clay was observed in Boring AR-3 to a depth of 4 feet and was underlain by clayey sand to a depth of approximately 17 feet. Interbedded gravel, sand, and minor clay and silt were observed in each boring from a depths of approximately 15 to 17 feet to 30 feet below grade. Boring AR-1 encountered clayey sand at the total depth of 30 feet below grade. Borings A-13, AR-2, and AR-3 were terminated in soils composed of clays with sand, which may represent a local aquitard. Groundwater was first encountered in each boring at depths ranging from 13.5 to 14.5 feet below grade. Water-levels stabilized after completion of the wells at depths ranging from 6.8 to 11.3 feet below grade and may indicate semi-confined to confined aquifer conditions.

SOIL CHEMICAL ANALYTICAL RESULTS

Soil samples were analyzed for TPH-Gasoline according to EPA Method 8015 (Modified) and BTEX according to EPA Method 8020. Chemical analyses were performed at Sequoia in Redwood City, California.

Soil chemical analytical data are summarized in Table 1. Five soil samples from Borings AR-1, AR-3, and A-13, collected at depths ranging between 4.5 and 10 feet below grade, were selected for chemical analysis. Soil samples from Boring AR-2 were not analyzed due to fill material encountered from ground surface to below first encountered groundwater. TPH-Gasoline was reported as not detected (ND) in each soil sample analyzed. Benzene was detected in the soil sample collected from Boring AR-1, at a depth of 5 feet, at a concentration of 0.014 parts per million (ppm). Benzene was reported as ND for the remaining soil samples. The Sequoia chemical analytical report and Chain-of-Custody form are presented in Appendix B.

GROUND-WATER MONITORING RESULTS

Depths to water-levels were measured in Wells A-13, AR-1, AR-2, and AR-3 prior to sampling on July 1, 1992. Static ground-water levels were measured from the surveyed top of each well box and recorded to the nearest $\pm$0.01 foot. Water-level measurements are referenced to Mean Sea Level (MSL) datum. Each well was inspected for the presence of floating product. Floating product was not observed in any well. Depth to groundwater and floating product measurements are presented in Table 2 (Field Monitoring Data). Historical depth to groundwater and floating product measurements are presented in Table 3.

GROUND-WATER CHEMICAL ANALYTICAL RESULTS

Groundwater samples were collected by Gettler-Ryan Inc. (G-R) from Wells A-13, AR-1, AR-2, and AR-3 on July 1, 1992. Groundwater samples were analyzed for TPH-Gasoline according to EPA Method 8015 (Modified) and BTEX according to EPA Method 8020. Chemical analyses were performed by Sequoia in Redwood City, California.

Ground-water chemical analytical data for Wells A-13, AR-1, AR-2, and AR-3 are presented in Table 4. TPH-Gasoline was detected in Well AR-1 at a concentration of 2,300 parts per billion (ppb). TPH-Gasoline was reported as ND for Wells A-13, AR-2, and AR-3. Benzene was identified in Wells AR-1 and AR-3 at concentrations of 260 ppb and 1.8 ppb, respectively. Benzene was reported as ND for Wells A-13 and AR-2. Chemical analytical data have been added to the Historical Ground-water Quality Database presented in Table 5. The Sequoia analytical report and Chain-of-Custody form are presented in Appendix C. G-R field data sheets are presented in Appendix D.

CURRENT QUARTER SAMPLING RESULTS

Depth to water-level measurements were obtained in each monitoring well prior to sampling on July 29, 1992. Static ground-water levels were measured from the surveyed top of each well box and recorded to the nearest $\pm$0.01 foot. Water-level data were referenced to Mean Sea Level (MSL) datum and used to construct a quarterly potentiometric map (Plate 3). Shallow ground-water flow is to the south and southwest at an approximate hydraulic gradient of 0.012.

Each well was checked for the presence of floating product. Floating product was observed in Wells A-4 and A-8 this quarter at measured thicknesses of 0.04 and 0.06, respectively. Current depth-to-water and floating product measurements are summarized in a table in the attached EMCON Associates (EMCON) ground-water sampling report (Appendix E). Historical water - level data and floating product measurements are presented in Table 4.

Floating product was removed from the product skimmer in Well A-8 on July 29, 1992. Approximately 0.25 gallons of product was recovered and emptied into an on-site drum. On September 14, 1992 water-levels had dropped below the skimmer intake. The skimmer was removed and approximately 0.5 gallons of product were bailed and emptied into an on-site drum. The skimmer was replaced in the well and set at a depth to allow product recovery. Approximately 0.75 gallons have been recovered from Well A-8 since the installation of the skimmer. The G-R daily reports for this work are presented in Appendix F.

Ground-water samples were collected on July 29 and 30, 1992. Samples were analyzed for TPH-Gasoline according to EPA Method 8015 (Modified) and for BTEX according to EPA Method 8020. The ground-water samples were analyzed by Sequoia, a California State-certified laboratory located in Redwood City, California. A table of current chemical analytical data are included in the EMCON report in Appendix E. Current chemical analytical data have been added to the Historical Ground - water Quality Database presented in Table 5. Chemical isoconcentration maps for TPH-Gasoline and benzene are presented on Plates 4 and 5, respectively.

SUMMARY

The results of this investigation are summarized below:

- Four exploratory soil borings were drilled on June 15 and 16, 1992 and completed as ground-water monitoring well A-13 and recovery wells AR-1 through AR-3.
- Lithology beneath the site consists primarily of clay, silt, and interbedded sand and gravel to the maximum depth explored of 30.0 feet below grade.
- Ground water-levels were initially encountered at depths of between 13.5 and 14.5 feet below grade. Water-levels stabilized at depths ranging from 6.8 to 11.3 feet below grade.
- TPH-Gasoline was reported as ND in each soil sample analyzed from Borings A-13 and AR-1 through AR-3. Benzene was identified in the soil sample from Boring AR-1 collected at a depth of 5 feet below grade at a concentration of 0.014 ppm. The remaining soil samples were reported as ND for benzene.
- Potentiometric data indicate that groundwater flows to the south and southwest at a calculated hydraulic gradient of 0.012.
- Floating product was observed in Wells A-4 and A-8 at measured thicknesses of 0.04 and 0.06 feet, respectively.

- Approximately 0.75 gallons of floating product was recovered from Well A-8 this quarter, utilizing a dedicated product skimmer and bailing.

- TPH-Gasoline was identified in ground-water samples from Wells AR-1, AR-2, and A-2 at concentrations ranging between 350 ppb and 1,600 ppb. Benzene was detected in Wells AR-1, AR-2, A-2, A-6, A-9, and A-10 at concentrations ranging between 0.64 ppb and 340 ppb.

CONCLUSIONS

Based on the results of this investigation, petroleum hydrocarbons have impacted soil and groundwater beneath the site. Current quarter ground-water analytical results indicate that floating product and dissolved petroleum hydrocarbons appear to be primarily on-site. Floating product was identified in on-site Wells A-4 and A-8 at thickness of 0.04 and 0.06-feet, respectively. Dissolved hydrocarbons have been identified in Wells A-2, AR-1 and AR-2 this quarter at concentrations ranging from 350 ppm to 1600 ppm.

Residual soil contamination appears to be present in isolated areas adjacent to the former tank complex. TPH-Gasoline contaminated soil, identified in soil samples from the tank complex excavation and product line trenching, was overexcavated and resampled. Overexcavation resampling indicated that TPH-Gasoline concentrations of less than 250 ppm are present in soils primarily from the west wall of the former tank complex. A minor benzene concentration was also identified in a soil sample analyzed from Boring AR-1 at a depth of 5-feet below grade. Additional soil contamination may exist in the capillary zone in the vicinity of Wells A-4 and A-8, where floating product has been observed.

If you have any questions, please call.

GeoStrategies Inc. by,

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Table 1. Soil Analyses Data
Table 2. Field Monitoring Data
Table 3. Historical Water-level Data
Table 4. Current Ground-water Chemical Analytical Data
Table 5. Historical Ground-water Quality Database

Plate 1. Vicinity Map
Plate 2. Site Plan
Plate 3. Potentiometric Map
Plate 4. TPH-G Isoconcentration Map
Plate 5. Benzene Isoconcentration Map

Appendix A: Exploratory Boring Logs and Well Construction Details
Appendix B: Soil Analytical Report and Chain-of-Custody Form
Appendix C: Groundwater Analytical Report and Chain-of-Custody Form
Appendix D: Gettler-Ryan Inc. Field Data Sheets
Appendix E: EMCON Ground-water Sampling Report
Appendix F: Gettler-Ryan Inc. Daily Reports

QC Review:

790901-19

References Cited

Dorothy H. Radbruch, 1957, Areal and Engineering Geology of the Oakland West Quadrangle, California, U.S. Geological Survey Map I-239.

TABLES

TABLE 1

SOIL ANALYSES DATA

SAMPLE I.D.	SAMPLE DATE	ANALYZED DATE	TPH-G (PPM)	BENZENE (PPM)	TOLUENE (PPM)	ETHYLBENZENE (PPM)	XYLENES (PPM)
A-13-4.5	16-Jun-92	24-Jun-92	<1.0	<0.005	<0.005	<0.005	<0.005
A-13-10	16-Jun-92	24-Jun-92	<1.0	<0.005	<0.005	<0.005	<0.005
AR-1-5	15-Jun-92	24-Jun-92	<1.0	0.014	0.042	0.018	0.10
AR-1-10	15-Jun-92	24-Jun-92	<1.0	<0.005	<0.005	<0.005	<0.005
AR-3-5	15-Jun-92	24-Jun-92	<1.0	<0.005	<0.005	<0.005	<0.005

TPH-G = Total Petrolueum Hydrocarbons calculated as Gasoline
PPM = Parts Per Million

Notes: 1. All data shown as <x are reported as ND (none detected).
2. The last number of the sample I.D. corresponds to the depth the sample was taken.

TABLE 2

FIELD MONITORING DATA

WELL NO.	MONITORING DATE	CASING DIA. (IN)	TOTAL WELL DEPTH (FT)	WELL ELEV. (FT)	DEPTH TO WATER (FT)	PRODUCT THICKNESS (FT)	STATIC WATER ELEV. (FT)	PURGED WELL VOLUMES	pH	TEMPERATURE (F)	CONDUCTIVITY (u MHOS/CM)
A-13	01-Jul-92	3	29.4	55.11	9.93	----	45.18	5	7.14	65.9	641
AR-1	01-Jul-92	6	29.5	54.72	9.55	----	44.45	2	6.98	65.7	574
AR-2	01-Jul-92	6	29.5	54.77	10.82	----	43.44	5	7.32	65.4	315
AR-3	01-Jul-92	4	29.3	54.19	9.62	----	44.08	5	7.02	63.7	587
AR-1 (30)	29-Jul-92	6	30.2	54.72	11.32	----	43.40	3	6.83	65.4	736
AR-2 (27)	29-Jul-92	6	27.5	54.77	11.90	----	42.87	5	6.90	65.7	651
AR-3 (29)	29-Jul-92	4	29.9	54.19	11.55	----	42.64	5	6.71	65.6	668
A-2 (19.5)	29-Jul-92	4	19.8	55.48	11.81	----	43.67	1	6.29	67.3	665
A-3 (17)	29-Jul-92	4	17.1	54.66	11.59	----	43.07	1	6.83	68.6	940
A-4	29-Jul-92	4	19.9	54.73	11.74	0.04	43.02	----	----	----	----
A-5 (24)	29-Jul-92	3	24.0	54.17	11.46	----	42.71	5	6.65	66.3	719
A-6 (24)	29-Jul-92	3	24.7	55.17	10.40	----	44.77	5	6.74	65.9	590
A-7 (22)	29-Jul-92	3	22.9	54.71	10.09	----	44.62	5	6.66	69.4	651
A-8	29-Jul-92	4	20.1	53.77	11.33	0.06	42.49	----	----	----	----
A-9 (38.5)	29-Jul-92	6	38.6	53.04	10.43	----	42.61	5	6.72	65.9	657

TABLE 2

FIELD MONITORING DATA

WELL NO.	MONITORING DATE	CASING DIA. (IN)	TOTAL WELL DEPTH (FT)	WELL ELEV. (FT)	DEPTH TO WATER (FT)	PRODUCT THICKNESS (FT)	STATIC WATER ELEV. (FT)	PURGED WELL VOLUMES	pH	TEMPERATURE (F)	CONDUCTIVITY (u MHOS/CM)
A-10 (30)	29-Jul-92	3	30.2	54.26	11.84	----	42.42	5	6.82	66.5	602
A-11 (28)	29-Jul-92	3	28.0	53.74	11.33	----	42.41	5	6.78	67.8	652
A-12 (28)	29-Jul-92	3	28.9	52.05	10.81	----	41.24	5	6.80	67.7	636
A-13 (29)	29-Jul-92	3	29.4	55.11	11.12	----	43.99	5	6.77	69.8	736

Notes: 1. Static water elevations referenced to Mean Sea Level (MSL).
2. Physical parameter measurements represent stabilized values.
3. pH values reported in pH units.
4. Static water-levels corrected for floating product (conversion factor = 0.80).

TABLE 3

HISTORICAL WATER-LEVEL DATA

MONITORING DATE	WELL NUMBER	DEPTH TO WATER (FT)	WELL ELEVATION (FT)	STATIC WATER ELEVATION (FT)	FLOATING PRODUCT THICKNESS (FT)
20-Mar-89	A-2	3.45	55.38	51.93	0.00
24-May-89	A-2	6.80	55.38	48.58	0.00
18-Aug-89	A-2	10.82	55.38	44.56	0.00
27-Oct-89	A-2	8.25	55.38	47.13	0.00
15-Jan-90	A-2	4.87	55.38	50.51	0.00
04-Apr-90	A-2	7.03	55.38	48.35	0.00
30-Jul-90	A-2	10.01	55.38	45.37	0.00
29-Oct-90	A-2	11.60	55.38	43.78	0.00
16-Jan-91	A-2	9.43	55.38	45.95	0.00
12-Apr-91	A-2	3.65	55.38	51.73	0.00
10-Jul-91	A-2	9.57	55.38	45.81	0.00
21-Oct-91	A-2	11.54	55.38	43.84	0.00
01-Feb-92	A-2	11.20	55.38	44.18	0.00
29-Apr-92	A-2	7.18	55.38	48.20	0.00
29-Jul-92	A-2	11.81	55.48	43.67	0.00
20-Mar-89	A-3	7.51	54.48	46.97	0.00
24-May-89	A-3	10.29	54.48	44.19	0.00
18-Aug-89	A-3	11.60	54.48	42.88	0.00
27-Oct-89	A-3	10.16	54.48	44.32	0.00
15-Jan-90	A-3	8.55	54.48	45.93	0.00
04-Apr-90	A-3	10.66	54.48	43.82	0.00
30-Jul-90	A-3	11.26	54.48	43.22	0.00
29-Oct-90	A-3	11.86	54.48	42.62	0.00
16-Jan-91	A-3	11.46	54.48	43.02	0.00
12-Apr-91	A-3	9.28	54.48	45.20	0.00
10-Jul-91	A-3	11.29	54.48	43.19	0.00
21-Oct-91	A-3	11.51	54.48	42.97	0.00
02-Feb-92	A-3	N/A	54.48	-----	----
29-Apr-92	A-3	N/A	54.48	-----	----
29-Jul-92	A-3	11.59	54.66	43.07	0.00

TABLE 3

HISTORICAL WATER-LEVEL DATA

MONITORING DATE	WELL NUMBER	DEPTH TO WATER (FT)	WELL ELEVATION (FT)	STATIC WATER ELEVATION (FT)	FLOATING PRODUCT THICKNESS (FT)
21-Mar-86	A-4	-----	54.62	-----	3.50
07-Jan-88	A-4	-----	54.62	-----	0.02
20-Mar-89	A-4	8.13	54.62	46.49	0.00
24-May-89	A-4	11.40	54.62	43.22	0.00
18-Aug-89	A-4	11.91	54.62	42.72	0.01
27-Oct-89	A-4	11.37	54.62	43.26	0.01
15-Jan-90	A-4	9.74	54.62	44.89	0.01
04-Apr-90	A-4	11.19	54.62	43.43	0.00
30-Jul-90	A-4	11.71	54.62	42.92	0.01
29-Oct-90	A-4	12.21	54.62	42.43	0.03
16-Jan-91	A-4	11.89	54.62	42.74	0.01
12-Apr-91	A-4	9.54	54.62	45.08	0.00
10-Jul-91	A-4	11.55	54.62	43.07	0.00
20-Sep-91	A-4	12.12	54.62	42.50	0.00
21-Oct-91	A-4	11.76	54.62	42.88	0.03
02-Feb-92	A-4	11.18	54.62	43.46	0.02
29-Apr-92	A-4	10.78	54.62	43.86	0.02
29-Jul-92	A-4	11.74	54.73	43.02	0.04
20-Mar-89	A-5	8.09	54.15	46.06	0.00
24-May-89	A-5	11.13	54.15	43.02	0.00
18-Aug-89	A-5	11.58	54.15	42.57	0.00
27-Oct-89	A-5	10.68	54.15	43.47	0.00
15-Jan-90	A-5	9.24	54.15	44.91	0.00
04-Apr-90	A-5	10.93	54.15	43.22	0.00
30-Jul-90	A-5	11.48	54.15	42.67	0.00
29-Oct-90	A-5	11.77	54.15	42.38	0.00
16-Jan-91	A-5	11.36	54.15	42.79	0.00
12-Apr-91	A-5	9.64	54.15	44.51	0.00
10-Jul-91	A-5	11.30	54.15	42.85	0.00

TABLE 3

HISTORICAL WATER-LEVEL DATA

MONITORING DATE	WELL NUMBER	DEPTH TO WATER (FT)	WELL ELEVATION (FT)	STATIC WATER ELEVATION (FT)	FLOATING PRODUCT THICKNESS (FT)
21-Oct-91	A-5	11.48	54.15	42.67	0.00
02-Feb-92	A-5	10.73	54.15	43.42	0.00
29-Apr-92	A-5	10.58	54.15	43.57	0.00
29-Jul-92	A-5	11.46	54.17	42.71	0.00
20-Mar-89	A-6	6.43	55.13	48.70	0.00
24-May-89	A-6	9.43	55.13	45.70	0.00
18-Aug-89	A-6	10.10	55.13	45.03	0.00
27-Oct-89	A-6	9.16	55.13	45.97	0.00
15-Jan-90	A-6	8.02	55.13	47.11	0.00
04-Apr-90	A-6	9.29	55.13	45.84	0.00
30-Jul-90	A-6	9.93	55.13	45.20	0.00
29-Oct-90	A-6	10.42	55.13	44.71	0.00
16-Jan-91	A-6	10.15	55.13	44.98	0.00
12-Apr-91	A-6	8.05	55.13	47.08	0.00
10-Jul-91	A-6	10.03	55.13	45.10	0.00
21-Oct-91	A-6	10.30	55.13	44.83	0.00
02-Feb-92	A-6	9.81	55.13	45.32	0.00
29-Apr-92	A-6	N/A	55.13	-----	----
29-Jul-92	A-6	10.40	55.17	44.77	0.00
20-Mar-89	A-7	6.29	54.67	48.38	0.00
24-May-89	A-7	9.26	54.67	45.41	0.00
18-Aug-89	A-7	9.97	54.67	44.70	0.00
27-Oct-89	A-7	9.02	54.67	45.65	0.00
15-Jan-90	A-7	7.90	54.67	46.77	0.00
04-Apr-90	A-7	9.15	54.67	45.52	0.00
30-Jul-90	A-7	9.80	54.67	44.87	0.00
29-Oct-90	A-7	10.30	54.67	44.37	0.00
16-Jan-91	A-7	11.35	54.67	43.32	0.00
12-Apr-91	A-7	7.90	54.67	46.77	0.00

TABLE 3

HISTORICAL WATER-LEVEL DATA

MONITORING DATE	WELL NUMBER	DEPTH TO WATER (FT)	WELL ELEVATION (FT)	STATIC WATER ELEVATION (FT)	FLOATING PRODUCT THICKNESS (FT)
10-Jul-91	A-7	9.82	54.67	44.85	0.00
21-Oct-91	A-7	10.12	54.67	44.55	0.00
02-Feb-92	A-7	9.28	54.67	45.39	0.00
29-Apr-92	A-7	8.85	54.67	45.82	0.00
29-Jul-92	A-7	10.09	54.71	44.62	0.00
21-Mar-86	A-8	-----	53.61	-----	0.02
07-Jan-88	A-8	-----	53.61	-----	0.18
20-Mar-89	A-8	8.21	53.61	45.93	0.66
24-May-89	A-8	11.41	53.61	43.16	1.20
18-Aug-89	A-8	10.88	53.61	43.35	0.77
27-Oct-89	A-8	11.66	53.61	43.00	1.31
15-Jan-90	A-8	9.84	53.61	44.47	0.87
04-Apr-90	A-8	11.35	53.61	42.46	0.25
30-Jul-90	A-8	10.48	53.61	44.53	1.75
29-Oct-90	A-8	11.39	53.61	42.30	0.10
16-Jan-91	A-8	11.11	53.61	42.51	0.01
12-Apr-91	A-8	9.16	53.61	44.46	0.01
10-Jul-91	A-8	10.73	53.61	42.89	0.01
21-Oct-91	A-8	10.98	53.61	42.72	0.11
02-Feb-92	A-8	10.80	53.61	43.93	1.40
29-Apr-92	A-8	11.15	53.61	43.50	1.30
29-Jul-92	A-8	11.33	53.77	42.49	0.06
20-Mar-89	A-9	6.28	52.96	46.68	0.00
24-May-89	A-9	10.12	52.96	42.84	0.00
18-Aug-89	A-9	9.51	52.96	43.45	0.00
27-Oct-89	A-9	8.56	52.96	44.40	0.00
15-Jan-90	A-9	7.20	52.96	45.76	0.00
04-Apr-90	A-9	8.78	52.96	44.18	0.00
30-Jul-90	A-9	10.16	52.96	42.80	0.00

TABLE 3

HISTORICAL WATER-LEVEL DATA

MONITORING DATE	WELL NUMBER	DEPTH TO WATER (FT)	WELL ELEVATION (FT)	STATIC WATER ELEVATION (FT)	FLOATING PRODUCT THICKNESS (FT)
29-Oct-90	A-9	10.71	52.96	42.25	0.00
16-Jan-91	A-9	10.44	52.96	42.52	0.00
12-Apr-91	A-9	8.69	52.96	44.27	0.00
10-Jul-91	A-9	10.23	52.96	42.73	0.00
20-Sep-91	A-9	10.47	52.96	42.49	0.00
21-Oct-91	A-9	10.39	52.96	42.57	0.00
02-Feb-92	A-9	9.05	52.96	43.91	0.00
29-Apr-92	A-9	9.56	52.96	43.40	0.00
29-Jul-92	A-9	10.43	53.04	42.61	0.00
20-Mar-89	A-10	8.52	54.16	45.64	0.00
24-May-89	A-10	11.31	54.16	42.85	0.00
18-Aug-89	A-10	11.82	54.16	42.34	0.00
27-Oct-89	A-10	10.94	54.16	43.22	0.00
15-Jan-90	A-10	9.58	54.16	44.58	0.00
04-Apr-90	A-10	N/A	54.16	-----	----
30-Jul-90	A-10	11.67	54.16	42.49	0.00
29-Oct-90	A-10	12.11	54.16	42.05	0.00
16-Jan-91	A-10	11.60	54.16	42.56	0.00
12-Apr-91	A-10	10.04	54.16	44.12	0.00
10-Jul-91	A-10	11.55	54.16	42.61	0.00
21-Oct-91	A-10	11.79	54.16	42.37	0.00
02-Feb-92	A-10	N/A	54.16	-----	----
29-Apr-92	A-10	10.85	54.16	43.31	0.00
29-Jul-92	A-10	11.84	54.26	42.42	0.00
20-Mar-89	A-11	8.11	53.75	45.64	0.00
24-May-89	A-11	10.92	53.75	42.83	0.00
18-Aug-89	A-11	11.52	53.75	42.23	0.00
27-Oct-89	A-11	10.63	53.75	43.12	0.00
15-Jan-90	A-11	9.22	53.75	44.53	0.00

TABLE 3

HISTORICAL WATER-LEVEL DATA

MONITORING DATE	WELL NUMBER	DEPTH TO WATER (FT)	WELL ELEVATION (FT)	STATIC WATER ELEVATION (FT)	FLOATING PRODUCT THICKNESS (FT)
04-Apr-90	A-11	10.85	53.75	42.90	0.00
30-Jul-90	A-11	11.29	53.75	42.46	0.00
29-Oct-90	A-11	11.66	53.75	42.09	0.00
16-Jan-91	A-11	11.31	53.75	42.44	0.00
12-Apr-91	A-11	9.55	53.75	44.20	0.00
10-Jul-91	A-11	11.18	53.75	42.57	0.00
21-Oct-91	A-11	11.24	53.75	42.51	0.00
02-Feb-92	A-11	10.70	53.75	43.05	0.00
29-Apr-92	A-11	10.57	53.75	43.18	0.00
29-Jul-92	A-11	11.33	53.74	42.41	0.00
20-Mar-89	A-12	8.00	52.05	44.05	0.00
24-May-89	A-12	10.35	52.05	41.70	0.00
18-Aug-89	A-12	10.75	52.05	41.30	0.00
27-Oct-89	A-12	10.06	52.05	41.99	0.00
15-Jan-90	A-12	8.88	52.05	43.17	0.00
04-Apr-90	A-12	10.30	52.05	41.75	0.00
30-Jul-90	A-12	10.66	52.05	41.39	0.00
29-Oct-90	A-12	10.90	52.05	41.15	0.00
16-Jan-91	A-12	10.60	52.05	41.45	0.00
12-Apr-91	A-12	9.45	52.05	42.60	0.00
10-Jul-91	A-12	10.56	52.05	41.49	0.00
21-Oct-91	A-12	10.62	52.05	41.43	0.00
02-Feb-92	A-12	10.10	52.05	41.95	0.00
29-Apr-92	A-12	10.19	52.05	41.86	0.00
29-Jul-92	A-12	10.81	52.05	41.24	0.00
01-Jul-92	A-13	9.93	55.11	45.18	0.00
29-Jul-92	A-13	11.12	55.11	43.99	0.00
01-Jul-92	AR-1	10.27	54.72	44.45	0.00

TABLE 3

HISTORICAL WATER-LEVEL DATA

MONITORING DATE	WELL NUMBER	DEPTH TO WATER (FT)	WELL ELEVATION (FT)	STATIC WATER ELEVATION (FT)	FLOATING PRODUCT THICKNESS (FT)
29-Jul-92	AR-1	11.32	54.72	43.40	0.00
01-Jul-92	AR-2	11.33	54.77	43.44	0.00
29-Jul-92	AR-2	11.90	54.77	42.87	0.00
01-Jul-92	AR-3	10.11	54.19	44.08	0.00
29-Jul-92	AR-3	11.55	54.19	42.64	0.00

N\A = Not accessible

Notes:
1. Static water elevations referenced to Mean Sea Level (MSL).
2. Static water-levels corrected for floating product (conversion factor = 0.80).
3. Wells A-3 and A-10 were not monitored on February 2, 1992 due to site construction activities.
4. Wells A-3 and A-6 were not monitored on April 29, 1992 due to site construction activities.
5. Water-level data prior to March, 1989 are not available.
6. Depths-to-water from Wells AR-1, AR-2, and AR-3 measured on July 1, 1992 were referenced to the top of the casing. These measurements have been adjusted to the top of well box reference.
7. Well elevations and depths-to-water are referenced to the top of the well box.
8. Wells re-surveyed April 30, 1992.

TABLE 4

GROUND-WATER ANALYSES DATA

WELL NO	SAMPLE DATE	ANALYZED DATE	TPH-G (PPB)	BENZENE (PPB)	TOLUENE (PPB)	ETHYLBENZENE (PPB)	XYLENES (PPB)
A-13	01-Jul-92	07-Jul-92	<50	<0.50	<0.50	<0.50	<0.50
AR-1	01-Jul-92	07-Jul-92	2300	260	150	38	470
AR-2	01-Jul-92	07-Jul-92	<50	<0.50	<0.50	<0.50	<0.50
AR-3	01-Jul-92	07-Jul-92	<50	1.8	0.86	<0.50	2.2
TB	01-Jul-92	07-Jul-92	<50	<0.50	<0.50	<0.50	<0.50
*AR-1(30)	29-Jul-92	08-Jul-92	1600	340	180	52	320
*AR-2(27)	29-Jul-92	08-Jul-92	350	130	8.5	<0.50	<0.50
*AR-3(29)	29-Jul-92	08-Jul-92	<50	1.6	<0.50	<0.50	<0.50
*A-2(19.5)	30-Jul-92	08-Jul-92	590	10	<0.50	<0.50	<0.50
*A-3(29)	30-Jul-92	08-Jul-92	<50	<0.50	<0.50	<0.50	<0.50
*A-4	NS	----	NS	NS	NS	NS	NS
*A-5(24)	30-Jul-92	08-Jul-92	<50	<0.50	<0.50	<0.50	<0.50
*A-6(24)	30-Jul-92	08-Jul-92	<50	0.64	<0.50	<0.50	<0.50
*A-7(22)	29-Jul-92	08-Jul-92	<50	<0.50	<0.50	<0.50	<0.50
*A-8	NS	----	NS	NS	NS	NS	NS

TABLE 4

GROUND-WATER ANALYSES DATA

WELL NO	SAMPLE DATE	ANALYZED DATE	TPH-G (PPB)	BENZENE (PPB)	TOLUENE (PPB)	ETHYLBENZENE (PPB)	XYLENES (PPB)
*A-9(38.5)	30-Jul-92	08-Jul-92	<50	14	<0.50	1.7	6.0
*A-10(30)	29-Jul-92	08-Jul-92	<50	25	<0.50	<0.50	1.8
*A-11(28)	30-Jul-92	08-Jul-92	<50	<0.50	<0.50	<0.50	<0.50
*A-12(28)	30-Jul-92	08-Jul-92	<50	<0.50	<0.50	<0.50	<0.50
*A-13(29)	30-Jul-92	08-Jul-92	<50	<0.50	<0.50	<0.50	<0.50
*XDup	30-Jul-92	08-Jul-92	1100	17	<0.50	5.4	12
*FB-1	30-Jul-92	08-Jul-92	<50	<0.50	<0.50	<0.50	<0.50
*TB-1	30-Jul-92	08-Jul-92	<50	<0.50	<0.50	<0.50	<0.50

CURRENT REGIONAL WATER QUALITY CONTROL BOARD MAXIMUM CONTAMINANT LEVELS
Benzene 1.0 ppb Xylenes 1750 ppb Ethylbenzene 680 ppb

CURRENT DHS ACTION LEVELS
Toluene 100.0 ppb

TPH-G = Total Petroleum Hydrocarbons calculated as Gasoline
PPB = Parts Per Billion
XDup = Duplicate Sample, Well A-2
TB = Trip Blank
NS = Not Sampled, floating product
* = Results of EMCON Report Appendix E

FB = Field Blank

Notes: 1. All data shown as <x are reported as ND (none detected).
2. DHS Action Levels and MCLs are subject to change pending State review.

TABLE 5

HISTORICAL GROUND WATER QUALITY DATABASE

SAMPLE DATE	SAMPLE POINT	TPH-G (PPB)	BENZENE (PPB)	TOLUENE (PPB)	ETHYLBENZENE (PPB)	XYLENES (PPB)
21-Mar-86	A-2	31000.	----	----	----	----
07-Jan-88	A-2	12000.	920.	1500.	----	4000.
20-Mar-89	A-2	22000.	1200.	1800.	1200.	7700.
24-May-89	A-2	9000.	460.	260.	250.	2400.
18-Aug-89	A-2	14000.	900.	200.	<200.	1300.
27-Oct-89	A-2	16000.	1200.	340.	90.	3100.
15-Jan-90	A-2	9900.	1100.	460.	150.	2900.
04-Apr-90	A-2	16000.	1100.	400.	380.	3900.
30-Jul-90	A-2	16000.	1400.	340.	290.	3600.
30-Jul-90	A-2	16000.	1400.	340.	290.	3600.
29-Oct-90	A-2	14000.	1100.	210.	66.	2700.
16-Jan-91	A-2	15000.	1200.	800.	190.	4600.
12-Apr-91	A-2	16000	640	290	280	2600
21-Oct-91	A-2	26000	1100	560	81	3900
02-Feb-92	A-2	11000	150	13	91	94
29-Apr-92	A-2	5400	120	16	129	19
30-Jul-92	A-2	590	10	<2.0	<2.0	9.0
21-Mar-86	A-3	1000.	----	----	----	----
07-Jan-88	A-3	250.	2.3	8.	----	21.
20-Mar-89	A-3	230.	1.6	<1.	3.	3.
24-May-89	A-3	170.	0.9	2.	1.	<3.
18-Aug-89	A-3	180.	0.7	1.	<1.	<3.
27-Oct-89	A-3	120.	<0.5	<0.5	<0.5	<1.
15-Jan-90	A-3	<50.	<0.5	<0.5	<0.5	<1.
04-Apr-90	A-3	88.	1.2	2.0	0.8	4.
30-Jul-90	A-3	120.	8.3	2.9	2.3	12.
29-Oct-90	A-3	780.	10.	27.	18.	85.
16-Jan-91	A-3	69.	2.0	3.5	<0.5	9.6
12-Apr-91	A-3	<30	<0.30	<0.30	<0.30	<0.30

TABLE 5

HISTORICAL GROUND WATER QUALITY DATABASE

SAMPLE DATE	SAMPLE POINT	TPH-G (PPB)	BENZENE (PPB)	TOLUENE (PPB)	ETHYLBENZENE (PPB)	XYLENES (PPB)
10-Jul-91	A-3	59	<0.30	<0.30	0.50	0.51
21-Oct-91	A-3	56	0.44	0.77	0.41	1.3
01-Feb-92	A-3		Not accessible			
29-Apr-92	A-3		Not accessible			
30-Jul-92	A-3	<50	<0.50	<0.50	<0.50	<0.50
21-Mar-86	A-4		Floating product			
07-Jan-88	A-4		Floating product			
20-Mar-89	A-4	360000.	1500.	3700.	6500.	35000.
24-May-89	A-4	1500000.	1000.	2000.	6000.	23000.
18-Aug-89	A-4		Floating product			
27-Oct-89	A-4		Floating product			
15-Jan-90	A-4		Floating product			
04-Apr-90	A-4	40000.	680.	320.	1400.	4900.
30-Jul-90	A-4		Floating product			
29-Oct-90	A-4		Floating product			
16-Jan-91	A-4		Floating product			
12-Apr-91	A-4	1800	<60	90	650	1700
10-Jul-91	A-4	61000	2700	8500	1700	8200
20-Sep-91	A-4	N/A	1200	5300	1500	11000
21-Oct-91	A-4		Floating product			
01-Feb-92	A-4		Floating product			
29-Apr-92	A-4		Floating product			
29-Jul-92	A-4		Floating product			
21-Mar-86	A-5	88.	----	----	----	----
07-Jan-88	A-5	<50.	0.5	1.	----	4.
20-Mar-89	A-5	60.	0.5	1.	2.	10.
24-May-89	A-5	<50.	0.5	<1.	<1.	<3.
18-Aug-89	A-5	<50.	<0.5	<1.	<1.	<3.
27-Oct-89	A-5	<50.	<0.50	<0.50	<0.50	<1.

TABLE 5

HISTORICAL GROUND WATER QUALITY DATABASE

SAMPLE DATE	SAMPLE POINT	TPH-G (PPB)	BENZENE (PPB)	TOLUENE (PPB)	ETHYLBENZENE (PPB)	XYLENES (PPB)
15-Jan-90	A-5	<50.	<0.5	<0.5	<0.5	<1.
04-Apr-90	A-5	<50.	<0.5	<0.5	<0.5	<1.
30-Jul-90	A-5	<50.	<0.5	<0.5	<0.5	<0.5
29-Oct-90	A-5	280.	<0.5	<0.5	<0.5	<0.5
16-Jan-91	A-5	<50.	<0.5	<0.5	<0.5	<0.5
12-Apr-91	A-5	<30	<0.30	<0.30	<0.30	0.84
10-Jul-91	A-5	<30	<0.30	<0.30	<0.30	<0.30
21-Oct-91	A-5	<30	<0.30	<0.30	<0.30	<0.30
01-Feb-92	A-5	<30	1.7	<0.30	<0.30	<0.30
29-Apr-92	A-5	<30	<0.30	<0.30	<0.30	<0.30
30-Jul-92	A-5	<50.	<0.50	<0.50	<0.50	<0.50
21-Mar-86	A-6	<10.	----	----	----	----
07-Jan-88	A-6	390.	54.	89.	----	110.
20-Mar-89	A-6	220.	33.	21.	9.	39.
24-May-89	A-6	110.	13.	6.	3.	13.
18-Aug-89	A-6	<50.	2.1	1.	<1.	<3.
27-Oct-89	A-6	55.	3.8	1.6	1.7	6.
15-Jan-90	A-6	100.	12.	2.5	5.5	18.
04-Apr-90	A-6	100.	17.	7.1	5.5	18.
30-Jul-90	A-6	<50.	2.6	<0.5	<0.5	1.2
29-Oct-90	A-6	<50.	0.7	<0.5	<0.5	<0.5
16-Jan-91	A-6	<50.	<0.5	<0.5	<0.5	<0.5
12-Apr-91	A-6	430	24	5.1	9.4	32
10-Jul-91	A-6	<30	1.4	0.39	0.47	1.5
21-Oct-91	A-6	<30	<0.30	<0.30	<0.30	<0.30
01-Feb-92	A-6	<30	2.0	0.40	0.58	1.7
29-Apr-92	A-6	Not accessible				
30-Jul-92	A-6	<50	0.64	<0.50	<0.50	<0.50
07-Jan-88	A-7	<50.	<0.5	1.	----	4.

TABLE 5

HISTORICAL GROUND WATER QUALITY DATABASE

SAMPLE DATE	SAMPLE POINT	TPH-G (PPB)	BENZENE (PPB)	TOLUENE (PPB)	ETHYLBENZENE (PPB)	XYLENES (PPB)
20-Mar-89	A-7	<50.	0.9	<1.	<1.	<3.
24-May-89	A-7	<50.	<0.5	<1.	<1.	<3.
18-Aug-89	A-7	<50.	<0.5	<1.	<1.	<3.
27-Oct-89	A-7	<50.	<0.5	<0.5	<0.5	<1.
15-Jan-90	A-7	<50.	<0.5	<0.5	<0.5	<1.
04-Apr-90	A-7	<50.	<0.5	<0.5	<0.5	<1.
30-Jul-90	A-7	<50.	<0.5	<0.5	<0.5	<0.5
29-Oct-90	A-7	<50.	2.7	7.6	1.1	3.0
16-Jan-91	A-7	<50.	<0.5	<0.5	<0.5	<0.5
12-Apr-91	A-7	<30	<0.30	<0.30	<0.30	0.48
10-Jul-91	A-7	<30	<0.30	0.49	<0.30	1.2
21-Oct-91	A-7	<30	<0.30	<0.30	<0.30	<0.30
01-Feb-92	A-7	<30	<0.30	<0.30	<0.30	<0.30
29-Apr-92	A-7	<30	<0.30	<0.30	<0.30	<0.30
29-Jul-92	A-7	<50.	<0.50	<0.50	<0.50	<0.50
21-Mar-86	A-8	Floating Product				
07-Jan-88	A-8	Floating Product				
20-Mar-89	A-8	Floating Product				
24-May-89	A-8	Floating Product				
18-Aug-89	A-8	Floating Product				
27-Oct-89	A-8	Floating Product				
15-Jan-90	A-8	Floating Product				
04-Apr-90	A-8	Floating Product				
30-Jul-90	A-8	Floating Product				
29-Oct-90	A-8	Floating Product				
16-Jan-91	A-8	Floating Product				
12-Apr-91	A-8	Floating Product				
10-Jul-91	A-8	Floating Product				
21-Oct-91	A-8	Floating Product				
01-Feb-92	A-8	Floating Product				

TABLE 5

HISTORICAL GROUND WATER QUALITY DATABASE

SAMPLE DATE	SAMPLE POINT	TPH-G (PPB)	BENZENE (PPB)	TOLUENE (PPB)	ETHYLBENZENE (PPB)	XYLENES (PPB)
29-Apr-92	A-8	Floating Product				
29-Jul-92	A-8	Floating Product				
07-Jan-88	A-9	300.	45.	14.	----	43.
21-Mar-89	A-9	50.	2.8	1.	1.	3.
24-May-89	A-9	120.	26.	12.	4.	79.
18-Aug-89	A-9	14000.	400.	800.	400.	2000.
27-Oct-89	A-9	1700.	150.	36.	30.	110.
15-Jan-90	A-9	860.	140.	58.	38.	140.
04-Apr-90	A-9	620.	36.	13.	9.4	32.
30-Jul-90	A-9	180.	77.	1.6	2.1	4.2
29-Oct-90	A-9	110.	30.	3.7	4.1	8.3
16-Jan-91	A-9	<50.	15.	<0.5	<0.5	0.6
12-Apr-91	A-9	130	52	0.83	5.3	6.0
10-Jul-91	A-9	<30	7.8	<0.30	<0.30	<0.30
20-Sep-91	A-9	N/A	21	<2.0	<2.0	<2.0
21-Oct-91	A-9	240	63	0.65	5.1	1.6
01-Feb-92	A-9	320	77	0.95	11	6.5
29-Apr-92	A-9	170	52	<0.30	5.6	1.4
30-Jul-92	A-9	<50	14	<0.50	1.7	6.0
07-Jan-88	A-10	<50.	0.6	11.	----	4.
20-Mar-89	A-10	<50.	<0.5	<1.	<1.	<3.
24-May-89	A-10	<50.	<0.5	<1.	<1.	<3.
18-Aug-89	A-10	<50.	<0.5	<1.	<1.	<3.
27-Oct-89	A-10	<50.	<0.5	<0.5	<0.5	<1.
15-Jan-90	A-10	<50.	<0.5	<0.5	<0.5	<1.
04-Apr-90	A-10	Not accessible				
30-Jul-90	A-10	<50.	<0.5	<0.5	<0.5	<0.5
29-Oct-90	A-10	<50.	2.3	6.9	1.2	3.0
16-Jan-91	A-10	<50.	<0.5	<0.5	<0.5	<0.5

TABLE 5

HISTORICAL GROUND WATER QUALITY DATABASE

SAMPLE DATE	SAMPLE POINT	TPH-G (PPB)	BENZENE (PPB)	TOLUENE (PPB)	ETHYLBENZENE (PPB)	XYLENES (PPB)
12-Apr-91	A-10	<30	0.67	0.55	<0.30	0.90
10-Jul-91	A-10	<30	<0.30	<0.30	<0.30	<0.30
21-Oct-91	A-10	<30	<0.30	<0.30	<0.30	<0.30
02-Feb-92	A-10	Not accessible				
29-Apr-92	A-10	<30	<0.30	<0.30	<0.30	<0.30
29-Jul-92	A-10	<50	25	<0.50	<0.50	1.8
07-Jan-88	A-11	<50.	1.1	2.	----	5.
20-Mar-89	A-11	<50.	<0.5	<1.	<1.	<3.
24-May-89	A-11	<50.	<0.5	<1.	<1.	<3.
18-Aug-89	A-11	<50.	<0.5	<1.	<1.	<3.
27-Oct-89	A-11	<50.	<0.5	<0.5	<0.5	<1.
15-Jan-90	A-11	<50.	<0.5	<0.5	<0.5	<1.
04-Apr-90	A-11	<50.	<0.5	<0.5	<0.5	<1.
30-Jul-90	A-11	<50.	<0.5	0.6	<0.5	0.5
29-Oct-90	A-11	<50.	0.6	2.4	0.6	1.5
16-Jan-91	A-11	<50.	<0.5	<0.5	<0.5	<0.5
12-Apr-91	A-11	<30	<0.30	0.37	<0.30	<0.30
10-Jul-91	A-11	<30	0.61	0.46	<0.30	1.0
21-Oct-91	A-11	<30	<0.30	<0.30	<0.30	<0.30
01-Feb-92	A-11	<30	<0.30	<0.30	<0.30	<0.30
29-Apr-92	A-11	<30	<0.30	<0.30	<0.30	<0.30
30-Jul-92	A-11	<50.	<0.50	<0.50	<0.50	<0.50
07-Jan-88	A-12	<50.	<0.5	2.	----	<4.
20-Mar-89	A-12	<50.	<0.5	<1.	<1.	<3.
24-May-89	A-12	<50.	<0.5	<1.	<1.	<3.
18-Aug-89	A-12	<50.	<0.5	<1.	<1.	<3.
27-Oct-89	A-12	<50.	<0.5	<0.5	<0.5	<1.
15-Jan-90	A-12	<50.	<0.5	<0.5	<0.5	<1.
04-Apr-90	A-12	<50.	<0.5	<0.5	<0.5	<1.

TABLE 5

HISTORICAL GROUND WATER QUALITY DATABASE

SAMPLE DATE	SAMPLE POINT	TPH-G (PPB)	BENZENE (PPB)	TOLUENE (PPB)	ETHYLBENZENE (PPB)	XYLENES (PPB)
30-Jul-90	A-12	<50.	<0.5	<0.5	<0.5	<0.5
29-Oct-90	A-12	<50.	<0.5	<0.5	<0.5	<0.5
16-Jan-91	A-12	<50.	<0.5	<0.5	<0.5	<0.5
12-Apr-91	A-12	<30	<0.30	<0.30	<0.30	<0.30
10-Jul-91	A-12	<30	<0.30	<0.30	<0.30	<0.30
21-Oct-91	A-12	<30	<0.30	<0.30	<0.30	<0.30
01-Feb-92	A-12	<30	<0.30	<0.30	<0.30	<0.30
29-Apr-92	A-12	<30	<0.30	<0.30	<0.30	<0.30
30-Jul-92	A-12	<50.	<0.50	<0.50	<0.50	<0.5
01-Jul-92	A-13	<50	<0.50	<0.50	<0.50	<0.50
30-Jul-92	A-13	<50	<0.50	<0.50	<0.50	<0.50
01-Jul-92	AR-1	2300	260	150	38	470
29-Jul-92	AR-1	1600	340	180	52	320
01-Jul-92	AR-2	<50	<0.50	<0.50	<0.50	<0.50
29-Jul-92	AR-2	350	130	8.5	<10	<10
01-Jul-92	AR-3	<50	1.8	0.86	<0.50	2.2
29-Jul-92	AR-3	<50	1.6	<0.50	<0.50	<0.50

Current Regional Water Quality Control Board Maximum Contaminant Levels
Benzene 1. ppb Xylenes 1750. ppb Ethylbenzene 680.ppb

Current DHS Action Levels Toluene 100.0 ppb

TPH-G = Total Petroleum Hydrocarbons calculated as Gasoline
PPB = Parts Per Billion
NOTE 1. All data shown as <X are reported as ND (none detected).

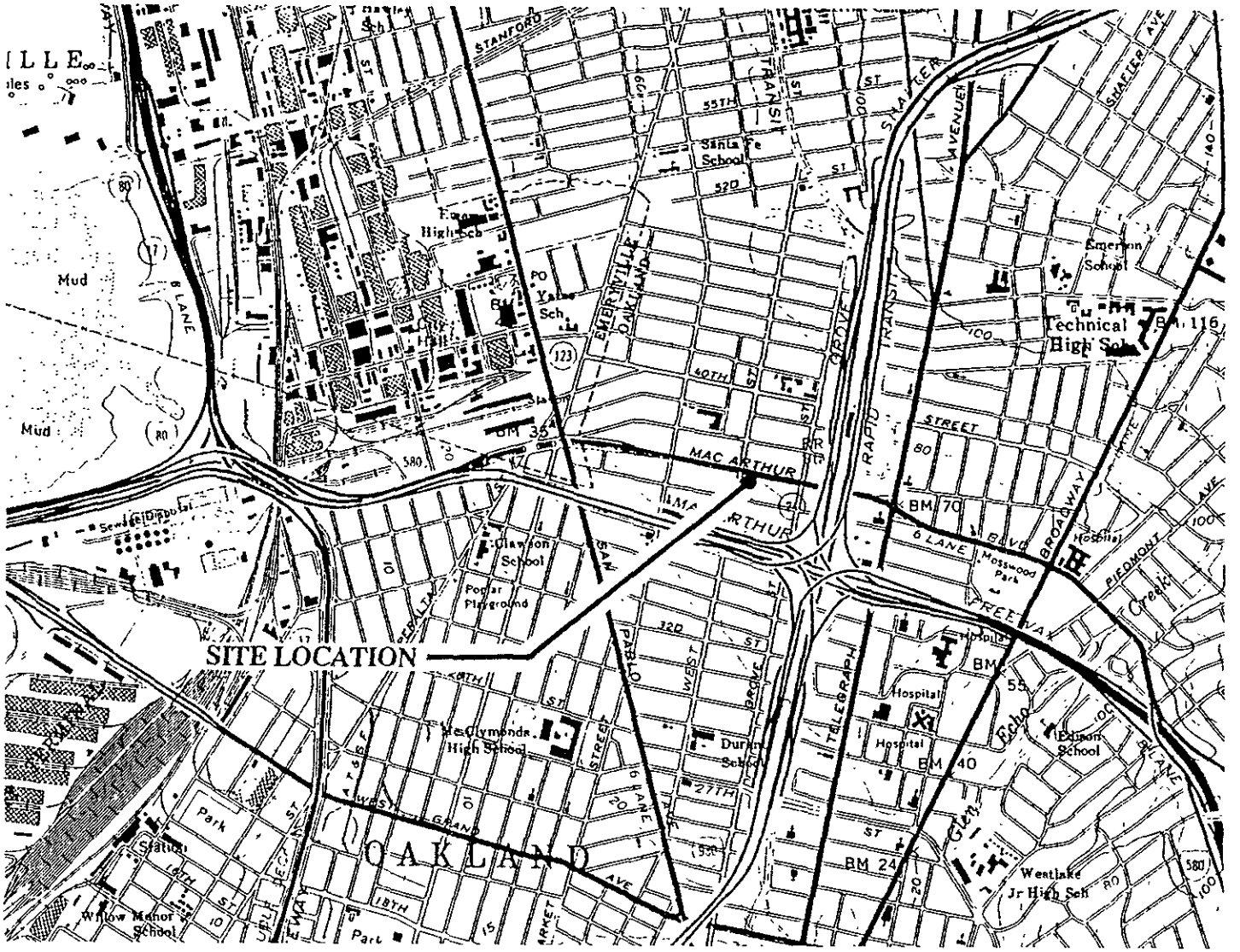
TABLE 5

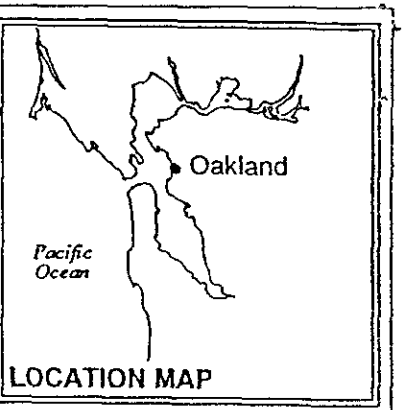
HISTORICAL GROUND WATER QUALITY DATABASE

SAMPLE DATE	SAMPLE POINT	TPH-G (PPB)	BENZENE (PPB)	TOLUENE (PPB)	ETHYLBENZENE (PPB)	XYLENES (PPB)

2. DHS Action Levels and MCL's are subject to change peding State review.
3. Ethylbenzene & Xylenes were combined in 1986 and 1988.
4. Wells A-4 and A-9 were sampled in September, 1991 for water discharge permits for the proposed groundwater treatment system.

ILLUSTRATIONS





Base Map: USGS Topographic Map

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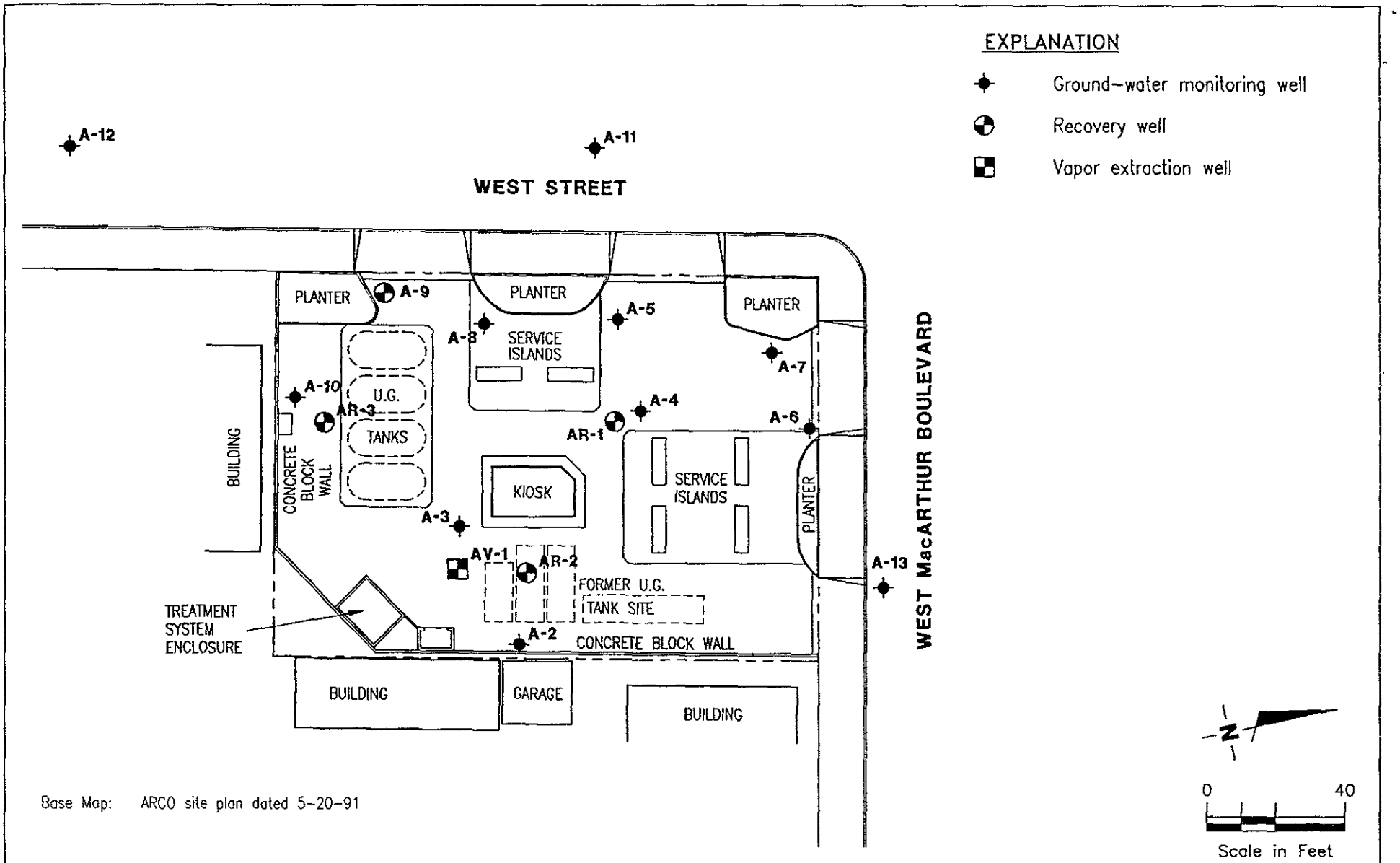
VICINITY MAP
ARCO Service Station #4931
731 West MacArthur Boulevard
Oakland, California

PLATE
1

JOB NUMBER	REVIEWED BY	DATE	REVISED DATE
7909		9/91	



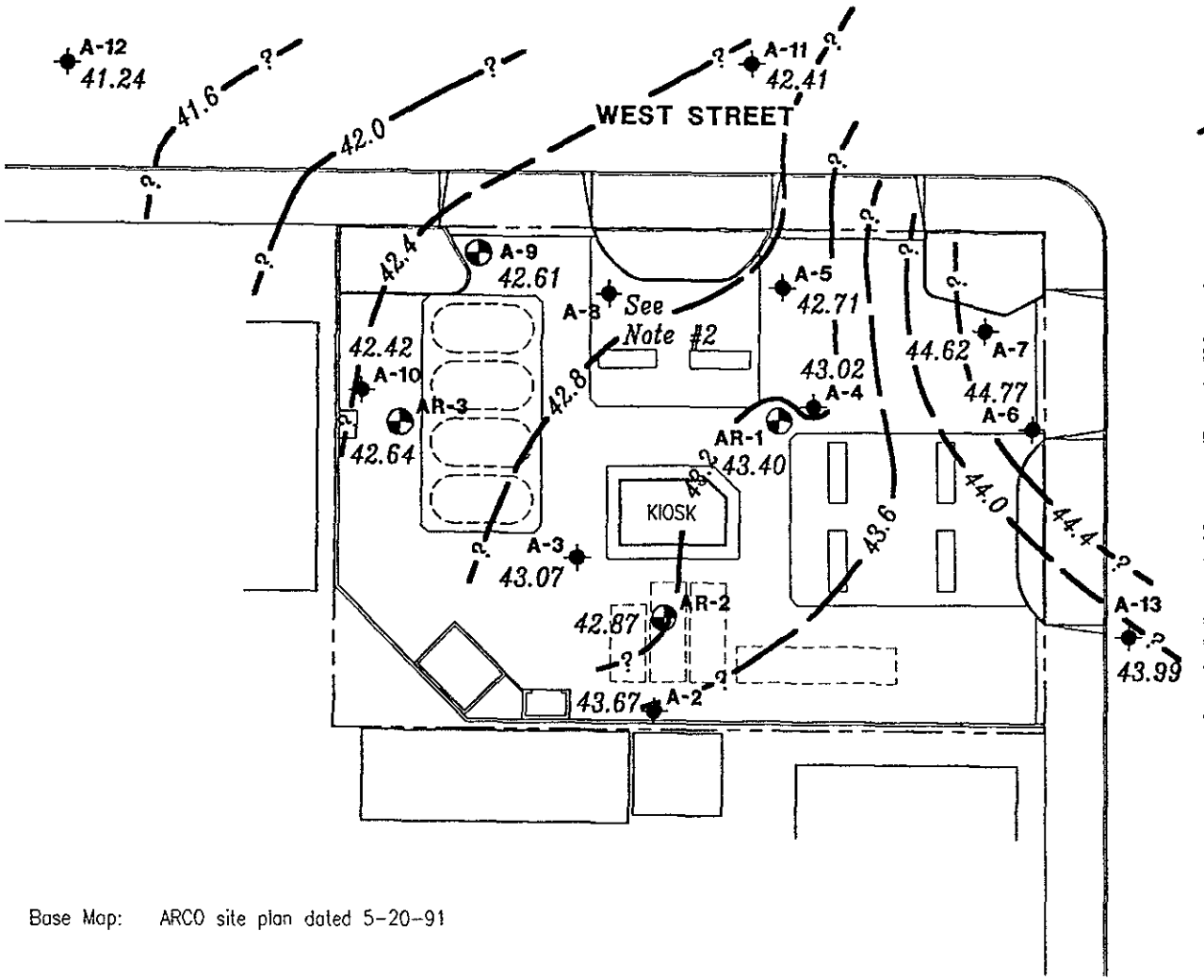
Base Map: ARCO site plan dated 5-20-91

GeoStrategies Inc.

SITE PLAN
ARCO Service Station #4931
731 West MacArthur Boulevard
Oakland, California

PLATE 2

JOB NUMBER	REVIEWED BY	DATE	REVISED DATE
7909		9/92	



EXPLANATION

- Ground-water monitoring well
- Recovery well
- 99.99 — Ground-water elevation contour. Approximate Gradient = 0.012
- 99.99 — Ground-water elevation in feet referenced to Mean Sea Level (MSL) measured on July 29, 1992

NOTES:
1. Contours may be influenced by irrigation practices and/or site construction activities.
2. Well A-8 was not used in contouring due to the presence of a dedicated product skimmer.

Base Map: ARCO site plan dated 5-20-91

N

0 40

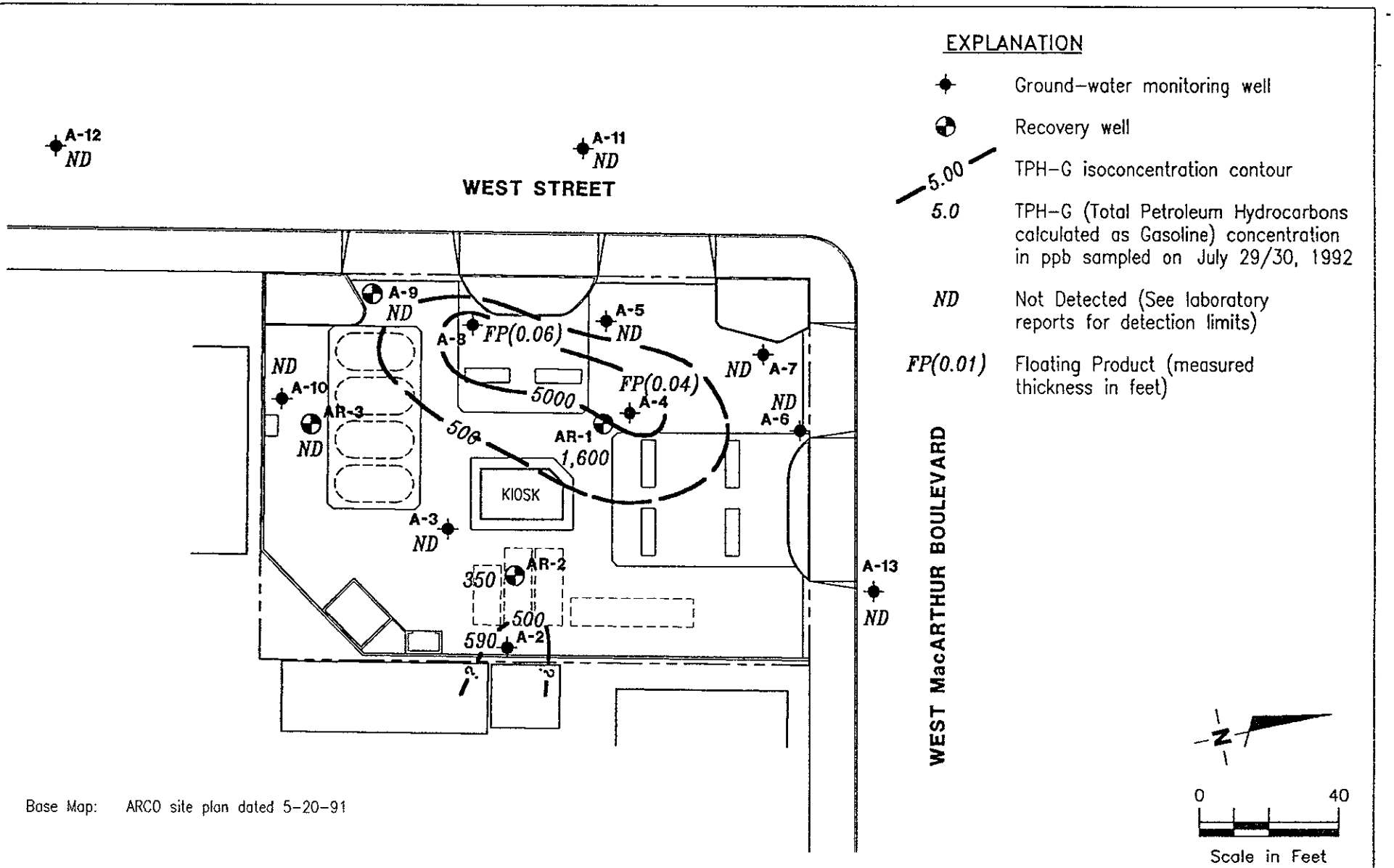
Scale in Feet

GeoStrategies Inc.

POTENTIOMETRIC MAP
ARCO Service Station #4931
731 West MacArthur Boulevard
Oakland, California

PLATE 3

JOB NUMBER	REVIEWED BY	DATE	REVISED DATE
790901-19	RCM	10/92	



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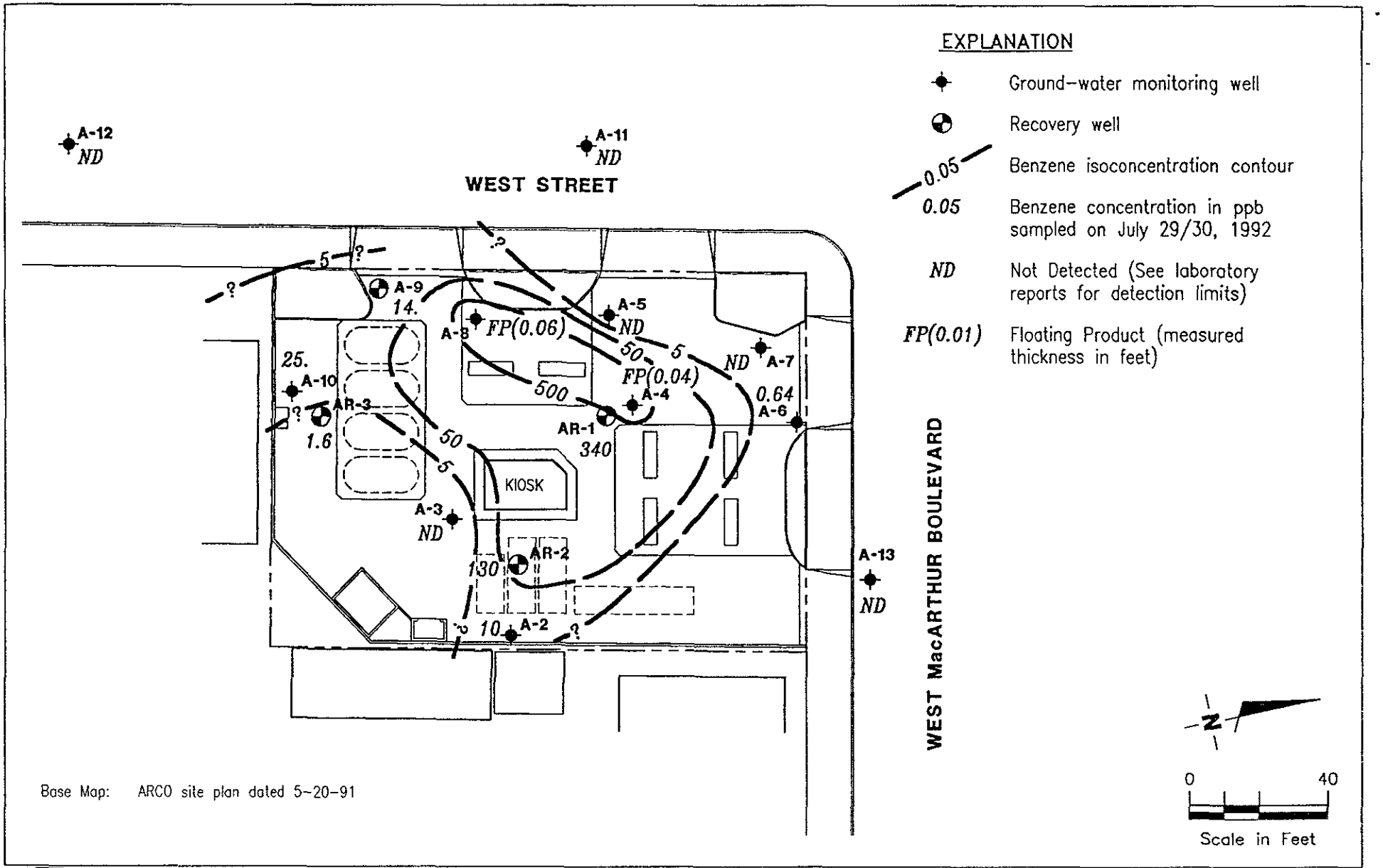
TPH-G ISOCONCENTRATION MAP
ARCO Service Station #4931
731 West MacArthur Boulevard
Oakland, California

PLATE 4

JOB NUMBER	REVIEWED BY	DATE	REVISED DATE
790901-19	RCM	10/92	



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BENZENE ISOCONCENTRATION MAP
ARCO Service Station #4931
731 West MacArthur Boulevard
Oakland, California

PLATE 5

JOB NUMBER	REVIEWED BY	DATE	REVISED DATE
790901-19	MCm	10/92	

APPENDIX A

EXPLORATORY BORING LOGS AND WELL CONSTRUCTION DETAILS

MAJOR DIVISIONS					TYPICAL NAMES
COARSE-GRAINED SOILS MORE THAN HALF IS COARSER THAN NO. 200 SIEVE	GRAVELS MORE THAN HALF COARSE FRACTION IS LARGER THAN NO. 4 SIEVE SIZE	CLEAN GRAVELS WITH LITTLE OR NO FINES	GW		WELL GRADED GRAVELS WITH OR WITHOUT SAND, LITTLE OR NO FINES
			GP		POORLY GRADED GRAVELS WITH OR WITHOUT SAND, LITTLE OR NO FINES
		GRAVELS WITH OVER 15% FINES	GM		SILTY GRAVELS, SILTY GRAVELS WITH SAND
			GC		CLAYEY GRAVELS, CLAYEY GRAVELS WITH SAND
	SANDS MORE THAN HALF COARSE FRACTION IS SMALLER THAN NO. 4 SIEVE SIZE	CLEAN SANDS WITH LITTLE OR NO FINES	SW		WELL GRADED SANDS WITH OR WITHOUT GRAVEL, LITTLE OR NO FINES
			SP		POORLY GRADED SANDS WITH OR WITHOUT GRAVEL, LITTLE OR NO FINES
		SANDS WITH OVER 15% FINES	SM		SILTY SANDS WITH OR WITHOUT GRAVEL
			SC		CLAYEY SANDS WITH OR WITHOUT GRAVEL
FINE-GRAINED SOILS MORE THAN HALF IS FINER THAN NO. 200 SIEVE	SILTS AND CLAYS LIQUID LIMIT 50% OR LESS		ML		INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTS WITH SANDS AND GRAVELS
			CL		INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY CLAYS WITH SANDS AND GRAVELS, LEAN CLAYS
			OL		ORGANIC SILTS OR CLAYS OF LOW PLASTICITY
	SILTS AND CLAYS LIQUID LIMIT GREATER THAN 50%		MH		INORGANIC SILTS, MICACEOUS OR DIATOMACIOUS, FINE SANDY OR SILTY SOILS, ELASTIC SILTS
			CH		INORGANIC CLAYS OF HIGH PLASTICITY, FAT CLAYS
			OH		ORGANIC SILTS OR CLAYS OF MEDIUM TO HIGH PLASTICITY
HIGHLY ORGANIC SOILS			PT		PEAT AND OTHER HIGHLY ORGANIC SOILS

LL	- Liquid Limit (%)
PI	- Plastic Index (%)
PID	- Volatile Vapors in ppm
MA	- *Particle Size Analysis*
2.5 YR 6/2	- Soil Color according to Munsell Soil Color Charts (1975 Edition)
5 GY 5/2	- GSA Rock Color Chart

☒	- No Soil Sample Recovered
■	- "Undisturbed" Sample
⊠	- Bulk or Classification Sample
▽	- First Encountered Ground Water Level
▼	- Piezometric Ground Water Level
Penetration	- Sample drive hammer weight - 140 pounds falling 30 inches. Blows required to drive *sampler 1 foot are indicated on the logs*

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Unified Soil Classification - ASTM D 2488-85 and Key to Test Data

Field location of boring: (See Plate 2)	Project No.: 790908	Date: 6/15/92	Boring No.: AR-1
	Client: ARCO Products Company SS#4931		
	Location: 731 W. MacArthur Boulevard		
	City: Oakland, California		Sheet 1 of 2
	Logged by: RCM	Driller: W. Hazmat	
Drilling method: Hollow Stem Auger	Casing installation data:		
Hole diameter: 12- Inches	Top of Box Elevation: 54.72'		Datum: MSL

Water Level	13.5'	11.3'
Time	11:02	16:25
Date	6/15/92	6/15/92

PID (ppm)	Blows/ft.* or Pressure (psi)	Type of Sample	Sample Number	Depth (ft.)	Sample	Well Detail	Soil Group Symbol (USCS)	Description
				1				PAVEMENT SECTION - 1.0 ft.
				2				CLAY (CL) - greenish grey (5 GY 5/1); medium stiff; damp; 90% clay; 5% silt; 5% fine sand.
				3				
	300	S&H		4				SILT (ML) - light olive brown (2.5 Y 5/6); medium stiff; damp; 90% silt; 10% clay.
	300		AR-1					
1178	300		5.0	5				
				6				
				7				
				8				
		S&H		9				Increase fine gravel to 5%; stiff; moist; greenish grey (5 BG 5/1) discoloration at 8.5 ft.
			AR-1					
62	12		10.0	10				
				11				
						▼		
				12				
				13				
						▽		Very stiff; saturated at 13.5 ft.
		S&H		14				
			AR-1					
18	18		15.0	15				
				16				
				17				
				18				GRAVEL with SAND (GW) - olive (5 Y 5/3); medium dense; saturated; 55% angular, fine to medium gravel; 40% subangular, fine to coarse sand; 5% fines.
		S&H		19				
			AR-1					SILT (ML) - dark yellowish brown (10 YR 5/6); very stiff; saturated; 90% silt; 5% fine sand; 5% clay.
837	26		20.0	20				

Remarks:

* Converted to equivalent standard penetration blows/ft.

GeoStrategies Inc.

Log of Boring

BORING NO. AR-1

JOB NUMBER	REVIEWED BY RG/CEG	DATE	REVISED DATE	REVISED DATE
790908				

Field location of boring:

(See Plate 2)

Project No.: 790908	Date: 6/15/92	Boring No: AR-1	
Client: ARCO Products Company SS#4931			
Location: 731 W. MacArthur Boulevard			
City: Oakland, California		Sheet 2 of 2	
Logged by: RCM	Driller: W. Hazmat		

Casing installation data:

Drilling method: Hollow Stem Auger

Hole diameter: 12- Inches

Top of Box Elevation: 54.72' Datum: MSL

Water Level									
Time									
Date									

PID (ppm)	Blows/ft.* or Pressure (psi)	Type of Sample	Sample Number	Depth (ft.)	Sample	Well Detail	Soil Group Symbol (USCS)	Description
				21				
				22				
				23				
		S&H		24				GRAVEL with SILT and SAND (GW-GM) - dark yellowish
			AR-1					brown (10 YR 4/6); medium dense; saturated; 60%
400	25		25.0	25				subangular to subrounded, fine to coarse
				26				gravel; 30% fine to coarse sand; 10% silt.
				27				
				28				
		S&H		29				SAND with CLAY (SW-SC) - pale olive (5 Y 6/3); dense;
			AR-1					saturated; 90% fine to coarse sand; 10% clay.
4.5	34		30.0	30				CLAYEY SAND (SC) - pale olive (5 Y 6/3); dense;
				31				saturated; 75% fine sand; 25% clay.
				32				
				33				Bottom of boring at 30.0 ft.
				34				6/15/92.
				35				
				36				
				37				
				38				
				39				
				40				

Remarks:

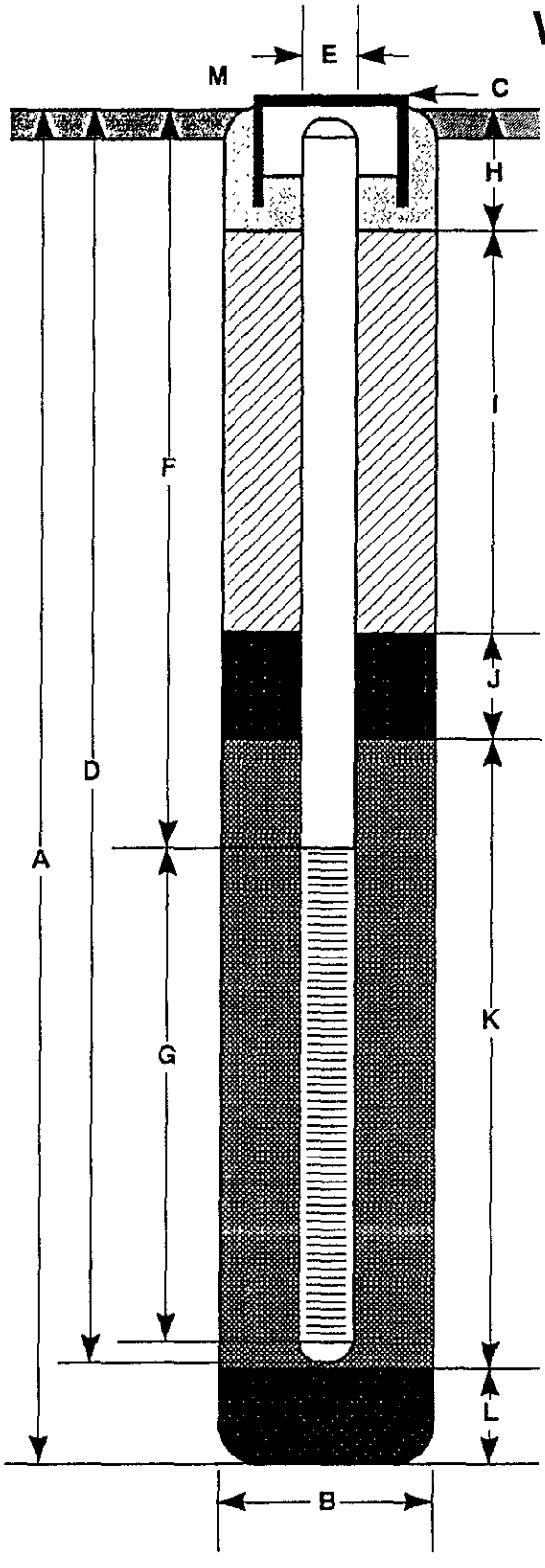
GeoStrategies Inc.

Log of Boring

BORING NO. AR-1

JOB NUMBER	REVIEWED BY BG/CEG	DATE	REVISED DATE	REVISED DATE
790908		6/92		

WELL CONSTRUCTION DETAIL



A Total Depth of Boring 30.0 ft.

B Diameter of Boring 12 in.
Drilling Method Hollow Stem Auger

C Top of Box Elevation 54.72 ft.
[X] Referenced to Mean Sea Level
[ ] Referenced to Project Datum

D Casing Length 30 ft.
Material Schedule 40 PVC

E Casing Diameter 6 in.

F Depth to Top Perforations 10.0 ft.

G Perforated Length 20.0 ft.
Perforated Interval from 10.0 to 30.0 ft.
Perforation Type Continuous Wrap
Perforation Size 0.020 in.

H Surface Seal from 0 to 1.0 ft.
Seal Material Concrete

I Backfill from 1.0 to 7.0 ft.
Backfill Material Neat Cement

J Seal from 7.0 to 8.0 ft.
Seal Material Bentonite

K Gravel Pack from 8.0 to 30.0 ft.
Pack Material Lonestar #2/12 Graded Sand

L Bottom Seal ft.
Seal Material

M Underground vault box with waterproof locking cap and lock

Note: Depths measured from initial ground surface.

GeoStrategies Inc.

Well Construction Detail

WELL NO.
AR-1

JOB NUMBER	REVIEWED BY RG/CEG	DATE	REVISED DATE	REVISED DATE
790908		6/92		

Field location of boring:

(See Plate 2)

Project No.:	790908	Date: 6/15/92	Boring No: AR-2
Client:	ARCO Products Company SS#4931		
Location:	731 W. MacArthur Boulevard		
City:	Oakland, California		Sheet 1 of 2
Logged by:	RCM	Driller: W. Hazmat	

Casing installation data:

Drilling method: Hollow Stem Auger

Hole diameter: 12- Inches

Top of Box Elevation: 54.77' Datum: MSL

Water Level	14.5'	6.8'		
Time	13:07	16:40		
Date	6/15/92	6/16/92		

PID (ppm)	Blows/ft.* or Pressure (psi)	Type of Sample	Sample Number	Depth (ft.)	Sample	Well Detail	Soil Group Symbol (USCS)	Description
				1				GRAVEL (GP) - greenish gray (5 Y 5/1); loose; damp; 100% fine gravel (Fill).
				2				
				3				
				4				
				5				
				6				
				7		▼		
				8				
				9				
				10				
				11				
				12				
				13				
				14				
		S&H		15		▽		
			AR-2					
49	14		16.0	16				CLAYEY SILT (ML/CL) - dark yellowish brown (10 YR 4/1); stiff; saturated; 60% silt; 30% clay; 10% very fine sand.
				17				
				18				Increase fine gravel to 15%; iron oxide staining at 18.5 ft.
		S&H		19				SAND with CLAY (SW-SC) - dark yellowish brown (10 YR 4/4); medium dense; saturated; 70% fine to medium sand; 20% fine subrounded gravel; 10% clay.
			AR-2					
11	21		20.0	20				

Remarks:

* Converted to equivalent standard penetration blows/ft.

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Log of Boring

BORING NO

AR-2

JOB NUMBER	REVIEWED BY RG/CEG	DATE	REVISED DATE	REVISED DATE
790908	JA	6/92		

Field location of boring:

(See Plate 2)

Project No.: 790908	Date: 6/15/92	Boring No: AR-2	
Client: ARCO Products Company SS#4931			
Location: 731 W. MacArthur Boulevard			
City: Oakland, California		Sheet 2 of 2	
Logged by: RCM	Driller: W. Hazmat		

Casing installation data:

Drilling method: Hollow Stem Auger

Hole diameter: 12- Inches

Top of Box Elevation: 54.77' Datum: MSL

Water Level				
Time				
Date				

PID (ppm)	Blows/ft.* or Pressure (psi)	Type of Sample	Sample Number	Depth (ft.)	Sample	Well Detail	Soil Group Symbol (USCS)	Description
				21				
				22				
				23				
		S&H		24				SAND (SP) - brown (10 YR 4/3); very dense; saturated;
			AR-2					95% fine sand; 5% fines.
4	58		25.0	25				GRAVEL with SAND (GW) - dark yellowish brown (10 YR
				26				4/4); very dense; saturated; 60% subangular to
				27				subrounded, fine to medium gravel; 35% fine to coarse
				28				sand; 5% fines.
		S&H		29				SAND with CLAY (SW-SC) - yellowish brown (10 YR 5/4);
			AR-2					medium dense; saturated; 75% fine to medium sand;
1	23		30.0	30				15% fine gravel; 10% clay.
				31				SANDY CLAY (CL) - pale olive (5 Y 6/3); very stiff; moist;
				32				60% clay; 35% fine sand; 5% fine gravel.
				33				Bottom of boring at 30.0 ft.
				34				6/15/92.
				35				
				36				
				37				
				38				
				39				
				40				

Remarks:

GeoStrategies Inc.

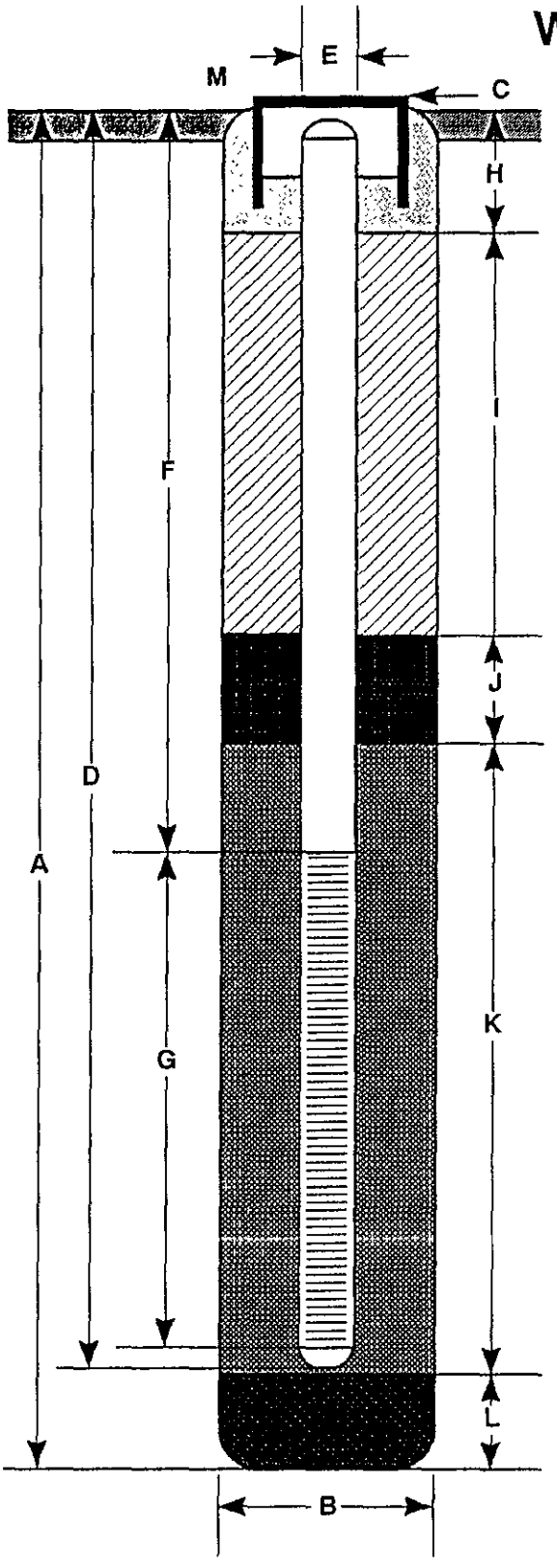
Log of Boring

BORING NO

AR-2

JOB NUMBER	REVIEWED BY RG/CEG	DATE	REVISED DATE	REVISED DATE
790908		6/92		

WELL CONSTRUCTION DETAIL



A Total Depth of Boring 30.0 ft.

B Diameter of Boring 12 in.
Drilling Method Hollow Stem Auger

C Top of Box Elevation 54.77 ft.
[x] Referenced to Mean Sea Level
[ ] Referenced to Project Datum

D Casing Length 28.0 ft.
Material Sch. 40 PVC & Carbon Steel

E Casing Diameter 6 in.

F Depth to Top Perforations 10.0 ft.

G Perforated Length 20.0 ft.
Perforated Interval from 8.0 to 28.0 ft.
Perforation Type Continuous Wrap
Perforation Size 0.020 in.

H Surface Seal from 0 to 1.0 ft.
Seal Material Concrete

I Backfill from 1.0 to 5.0 ft.
Backfill Material Neat Cement

J Seal from 5.0 to 6.0 ft.
Seal Material Bentonite

K Gravel Pack from 6.0 to 28.0 ft.
Pack Material Lonestar #2/12 Graded Sand

L Bottom Seal 2.0 ft.
Seal Material Native Material

M Underground vault box with waterproof locking cap and lock.

Note: Depths measured from initial ground surface.

GeoStrategies Inc.

Well Construction Detail

WELL NO.
AR-2

JOB NUMBER	REVIEWED BY RG/CEG	DATE	REVISED DATE	REVISED DATE
790908		6/92		

Field location of boring: (See Plate 2)	Project No.: 790908	Date: 6/16/92	Boring No.: AR-3
	Client: ARCO Products Company SS#4931		
	Location: 731 W. MacArthur Boulevard		
	City: Oakland, California		Sheet 1 of 2
	Logged by: RCM	Driller: W. Hazmat	
Drilling method: Hollow Stem Auger	Casing installation data:		
Hole diameter: 10 - Inches	Top of Box Elevation: 54.19'		Datum: MSL

Water Level	13.5'	10.5'
Time	13:55	16:50
Date	6/16/92	6/16/92

PID (ppm)	Blows/ft*. or Pressure (psi)	Type of Sample	Sample Number	Depth (ft.)	Sample	Well Detail	Soil Group Symbol (USCS)	Description
				1				PAVEMENT SECTION - 1.0 ft.
				2				CLAY (CL) - very dark gray (10 YR 3/1); stiff; damp; 80% clay; 20% fine sand.
				3				
		S&H		4				COLOR CHANGE to light olive brown (2.5 Y 5/4) at 3.5 feet.
			AR-3					
3	32		5.0	5				
				6				CLAYEY SAND (SC) - yellowish brown (10 YR 5/6); dense; moist; 60% fine to medium sand; 30% clay; 10% fine gravel; iron oxide stains.
				7				
				8				
		S&H		9				No sample recovery at 8.5 feet; gravel stuck in shoe of sampler.
	28			10				
				11		▼		
				12				
				13				
						▽		Saturated; dense at 13.5 ft.
		S&H		14				
			AR-3					
0	37		15.0	15				
				16				
				17				
				18				
		S&H		19				CLAYEY GRAVEL (GC) - dark yellowish brown (10 YR 4/6); dense; saturated; 60% fine to medium gravel; 20% fien to coarse sand; 20% clay.
			AR-3					
0	32		20.0	20				

Remarks:

* Converted to equivalent standard penetration blows/ft.

GSI GeoStrategies Inc.

Log of Boring

BORING NO. AR-3

JOB NUMBER	REVIEWED BY RG/CEG	DATE	REVISED DATE	REVISED DATE
790908	JPR	6/92		

Field location of boring:

(See Plate 2)

Project No.: 790908	Date: 6/16/92	Boring No.: AR-3	
Client: ARCO Products Company SS#4931			
Location: 731 W. MacArthur Boulevard			
City: Oakland, California		Sheet 2 of 2	
Logged by: RCM	Driller: W. Hazmat		

Casing installation data:

Drilling method: Hollow Stem Auger

Hole diameter: 10- Inches

Top of Box Elevation: 54.19' Datum: MSL

Water Level				
Time				
Date				

PID (ppm)	Blows/ft.* or Pressure (psi)	Type of Sample	Sample Number	Depth (ft.)	Sample	Well Detail	Soil Group Symbol (USCS)	Description
				21				
				22				
				23				
		S&H		24				SAND with CLAY (SW-SC) - brown (10 YR 4/3); very dense; saturated; 70% fine to coarse sand; 20% gravel; 10% clay.
			AR-3					
3	80		25.0	25				GRAVEL with CLAY (GW-GC) - brown (10YR 4/3) very dense; saturated; 60% fine to coarse, subangular to subrounded gravel; 30% medium to coarse sand; 10% clay.
				26				
				27				Softer drilling at 26.0 ft.
				28				
		S&H		29				CLAY with SAND (CL) - reddish brown (5 YR 4/3); hard; moist; 70% clay; 30% fine to coarse sand.
			AR-3					
0	35		30.0	30				
				31				
				32				Bottom of boring at 30.0 ft. 6/16/92.
				33				
				34				
				35				
				36				
				37				
				38				
				39				
				40				

Remarks:

GeoStrategies Inc.

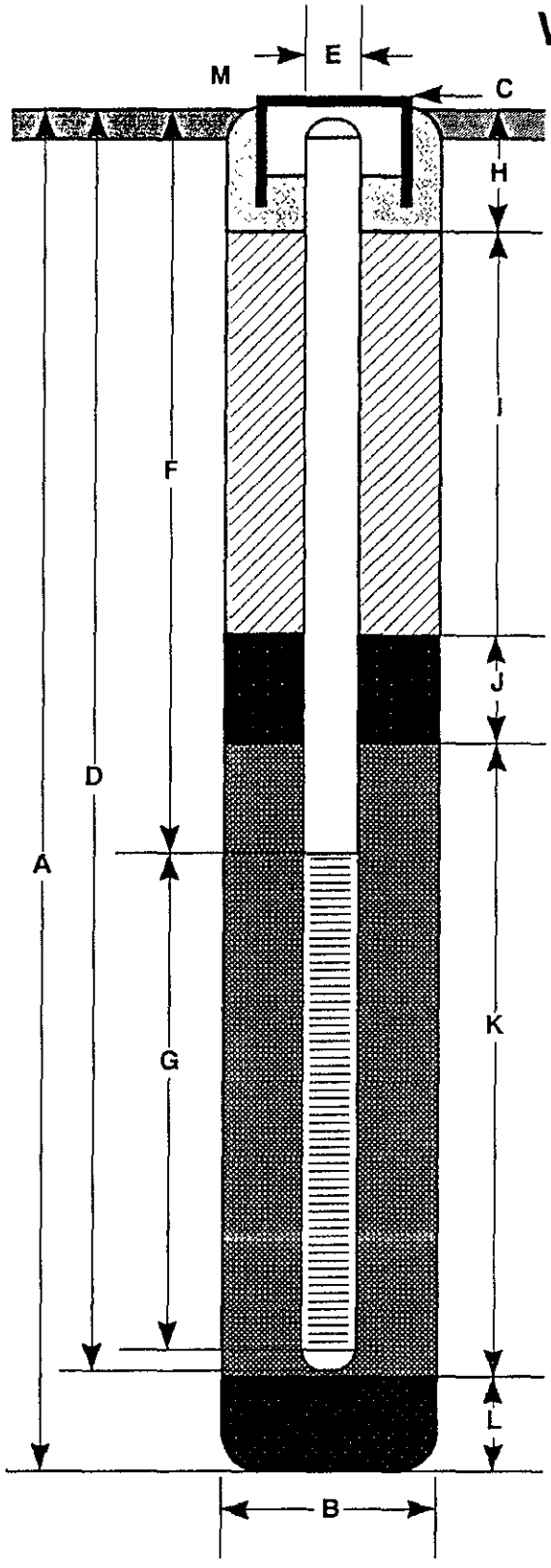
Log of Boring

BORING NO.

AR-3

JOB NUMBER	REVIEWED BY RG/CEG	DATE	REVISED DATE	REVISED DATE
790908		6/92		

WELL CONSTRUCTION DETAIL



A Total Depth of Boring 30.0 ft.

B Diameter of Boring 10 in.
Drilling Method Hollow Stem Auger

C Top of Box Elevation 54.19 ft.
[X] Referenced to Mean Sea Level
[ ] Referenced to Project Datum

D Casing Length 30.0 ft.
Material Sch. 40 PVC & Carbon Steel

E Casing Diameter 4 in.

F Depth to Top Perforations 10.0 ft.

G Perforated Length 20.0 ft.
Perforated Interval from 10.0 to 30.0 ft.
Perforation Type Continuous Wrap
Perforation Size 0.020 in.

H Surface Seal from 0 to 1.0 ft.
Seal Material Concrete

I Backfill from 1.0 to 7.0 ft.
Backfill Material Neat Cement

J Seal from 7.0 to 8.0 ft.
Seal Material Bentonite

K Gravel Pack from 8.0 to 30.0 ft.
Pack Material Lonestar #2/12 Graded Sand

L Bottom Seal ft.
Seal Material

M Underground vault box with waterproof locking cap and lock

Note: Depths measured from initial ground surface.

GeoStrategies Inc.

Well Construction Detail

WELL NO.
AR-3

JOB NUMBER	REVIEWED BY RG/CEG	DATE	REVISED DATE	REVISED DATE
790908	JCV	6/92		

Field location of boring:

(See Plate 2)

Project No.: 790908	Date: 6/15/92	Boring No: A-13	
Client: ARCO Products Company SS#4931			
Location: 731 W. MacArthur Boulevard			
City: Oakland, California		Sheet 1 of 2	
Logged by: RCM	Driller: W. Hazmat		

Casing installation data:

Drilling method: Hollow Stem Auger

Hole diameter: 10- Inches

Top of Box Elevation: 55.11' Datum: MSL

Water Level	14.5'	10.2'		
Time	10:32	17:25		
Date	6/16/92	6/16/92		

PID (ppm)	Blows/ft.* or Pressure (psi)	Type of Sample	Sample Number	Depth (ft.)	Sample	Well Detail	Soil Group Symbol (USCS)	Description
								PAVEMENT SECTION - 1.0 ft.
				1				
								CLAY (CL) - light olive brown (2.5 Y 5/4); medium stiff;
				2				damp; 80% clay; 10% silt; 10% fine sand.
				3				
	300	S&H	A-13	4				Increase fine to coarse sand to 25%; moist at 4.0 ft.
0	300	(push)	4.5					
	380			5				COLOR CHANGE to yellowish brown (10 YR 5/6) at 4.5 ft.
				6				
				7				
				8				
	250	S&H		9				Gray (5 Y 6/1) discoloration in small voids at 8.5 ft.
	300	(push)	A-13					
0	350		10.0	10		▼		
				11				
				12				
				13				
		S&H		14				
			A-13			▽		
1	19		15.0	15				CLAYEY SAND (SC) - dark yellowish brown (10 YR 4/4);
				16				medium dense; saturated; 60% medium to coarse,
				17				subrounded sand; 35% clay; 5% fine gravel.
				18				
		S&H	A-13	19				Increase sand to 75% at 18.5 ft.
3			19.5					
	42			20				

Remarks:

* *Converted to equivalent standard penetration blows/ft.*

GSI GeoStrategies Inc.

Log of Boring

BORING NO. A-13

JOB NUMBER	REVIEWED BY RG/CEG	DATE	REVISED DATE	REVISED DATE
790908		6/92		

Field location of boring:

(See Plate 2)

Project No.: 790908	Date: 6/15/92	Boring No: A-13	
Client: ARCO Products Company SS#4931			
Location: 731 W. MacArthur Boulevard			
City: Oakland, California		Sheet 2 of 2	
Logged by: RCM	Driller: W. Hazmat		

Drilling method: Hollow Stem Auger

Hole diameter: 10- Inches

Casing installation data:

Top of Box Elevation: 55.11' Datum: MSL

Water Level				
Time				
Date				

PID (ppm)	Blows/ft.* or Pressure (psi)	Type of Sample	Sample Number	Depth (ft.)	Sample	Well Detail	Soil Group Symbol (USCS)	Description
				21				
				22				
				23				
		S&H		24				SAND with CLAY (SW-SC) - dark yellowish brown (10 YR 4/4); dense; saturated; 80% fine to coarse sand; 10% clay; 10% fine gravel.
			A-13					
0	33		25.0	25				
				26				
				27				
				28				
		S&H		29				
			A-13					SANDY CLAY (CL) - pale olive (5 Y 6/3); very stiff; moist; 60% clay; 40% fine sand.
0	30		30.0	30				
				31				
				32				Bottom of boring at 30.0 ft. 6/16/92.
				33				
				34				
				35				
				36				
				37				
				38				
				39				
				40				

Remarks:

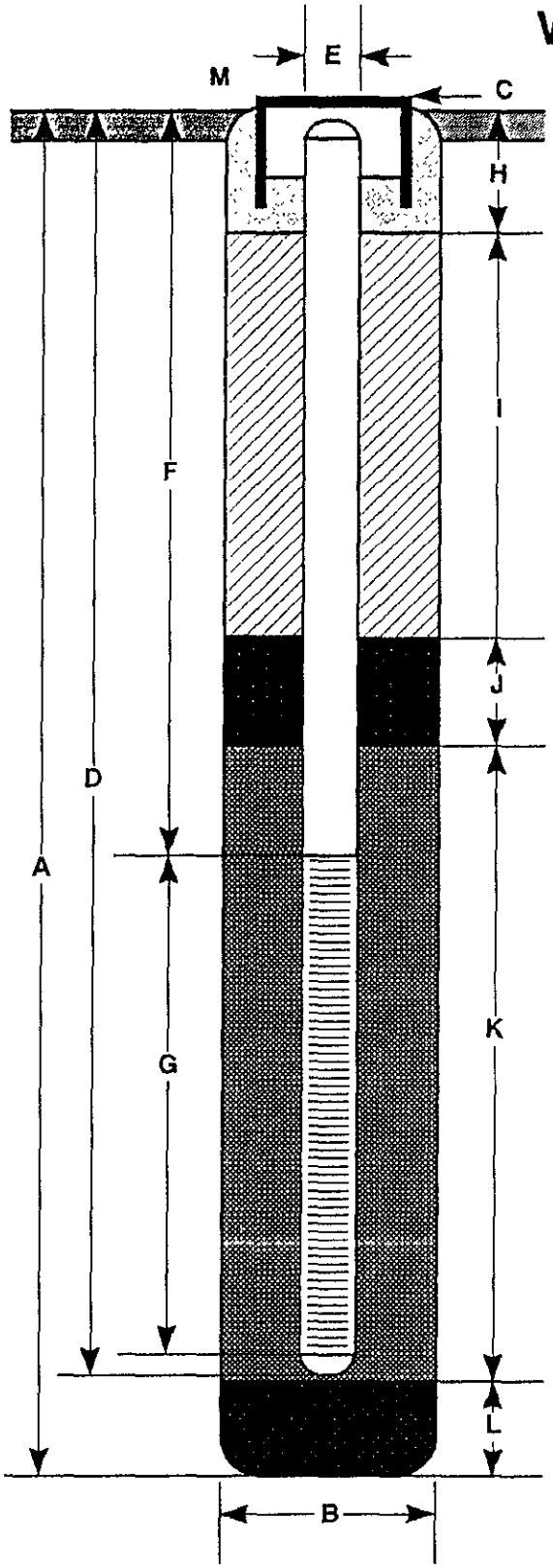
GeoStrategies Inc.

Log of Boring

BORING NO. A-13

JOB NUMBER	REVIEWED BY RG/CEG	DATE	REVISED DATE	REVISED DATE
790908	JPW	6/92		

WELL CONSTRUCTION DETAIL



A Total Depth of Boring 30.0 ft.

B Diameter of Boring 10 in.
Drilling Method Hollow Stem Auger

C Top of Box Elevation 55.11 ft.
[X] Referenced to Mean Sea Level
[ ] Referenced to Project Datum

D Casing Length 30.0 ft.
Material Schedule 40 PVC

E Casing Diameter 3 in.

F Depth to Top Perforations 10.0 ft.

G Perforated Length 20.0 ft.
Perforated Interval from 10.0 to 30.0 ft.
Perforation Type Factory Slotted
Perforation Size 0.020 in.

H Surface Seal from 0 to 1.0 ft.
Seal Material Concrete

I Backfill from 1.0 to 7.0 ft.
Backfill Material Neat Cement

J Seal from 7.0 to 8.0 ft.
Seal Material Bentonite

K Gravel Pack from 8.0 to 30.0 ft.
Pack Material Lonestar #2/12 Graded Sand

L Bottom Seal ft.
Seal Material

M Traffic rated vault box with waterproof locking cap and lock

Note: Depths measured from initial ground surface.

GeoStrategies Inc.

Well Construction Detail

WELL NO. A-13

JOB NUMBER	REVIEWED BY RG/CEG	DATE	REVISED DATE	REVISED DATE
790908	JPV	6/92		

APPENDIX B

SOIL ANALYTICAL REPORT AND CHAIN-OF-CUSTODY FORM

SEQUOIA ANALYTICAL
680 Chesapeake Drive • Redwood City, CA 94063
(415) 364-9600 • FAX (415) 364-9233

Gettler Ryan
2150 W. Winton Avenue
Hayward, CA 94545
Attention: John Vargas

Project: 4931-91-2, Arco 4931, Oakland

Enclosed are the results from 5 soil samples received at Sequoia Analytical on June 22,1992. The requested analyses are listed below:

SAMPLE #	SAMPLE DESCRIPTION	DATE OF COLLECTION	TEST METHOD
2064004	Soil, A-13-4.5	6/16/92	EPA 5030/8015/8020
2064005	Soil, A-13-10	6/16/92	EPA 5030/8015/8020
2064006	Soil, AR-1-5	6/15/92	EPA 5030/8015/8020
2064007	Soil, AR-1-10	6/15/92	EPA 5030/8015/8020
2064008	Soil, AR-3-5	6/16/92	EPA 5030/8015/8020

Please contact me if you have any questions. In the meantime, thank you for the opportunity to work with you on this project.

Very truly yours,

SEQUOIA ANALYTICAL

Nokowhat D. Herrera
Project Manager

909-A

SEQUOIA ANALYTICAL

680 Chesapeake Drive • Redwood City, CA 94063
(415) 364-9600 • FAX (415) 364-9233

Gettler Ryan	Client Project ID:	4931-91-2, Arco 4931, Oakland	Sampled:	6/15-16/92
2150 W. Winton Avenue	Sample Matrix:	Soil	Received:	Jun 22, 1992
Hayward, CA 94545	Analysis Method:	EPA 5030/8015/8020	Reported:	Jul 5, 1992
Attention: John Vargas	First Sample #:	206-4004		

TOTAL PURGEABLE PETROLEUM HYDROCARBONS with BTEX DISTINCTION

Analyte	Reporting Limit mg/kg	Sample I.D. 206-4004 A-13-4.5	Sample I.D. 206-4005 A-13-10	Sample I.D. 206-4006 AR-1-5	Sample I.D. 206-4007 AR-1-10	Sample I.D. 206-4008 AR-3-5	Sample I.D.
Purgeable Hydrocarbons	1.0	N.D.	N.D.	N.D.	N.D.	N.D.	
Benzene	0.005	N.D.	N.D.	0.014	N.D.	N.D.	
Toluene	0.005	N.D.	N.D.	0.042	N.D.	N.D.	
Ethyl Benzene	0.005	N.D.	N.D.	0.018	N.D.	N.D.	
Total Xylenes	0.005	N.D.	N.D.	0.10	N.D.	N.D.	
Chromatogram Pattern:		--	--	Gas	--	--	

Quality Control Data

Report Limit Multiplication Factor:	1.0	1.0	1.0	1.0	1.0
Date Analyzed:	6/24/92	6/24/92	6/24/92	6/24/92	6/24/92
Instrument Identification:	GCHP-1	GCHP-1	GCHP-1	GCHP-1	GCHP-1
Surrogate Recovery, %: (QC Limits = 70-130%)	80	107	112	102	111

Purgeable Hydrocarbons are quantitated against a fresh gasoline standard.
Analytes reported as N.D. were not detected above the stated reporting limit.

SEQUOIA ANALYTICAL

Nokowhat D. Herrera
Project Manager

SEQUOIA ANALYTICAL

680 Chesapeake Drive • Redwood City, CA 94063
(415) 364-9600 • FAX (415) 364-9233

Gettler Ryan
2150 W. Winton Avenue
Hayward, CA 94545
Attention: John Vargas

Client Project ID: 4931-91-2, Arco 4931, Oakland

QC Sample Group: 2064004 - 08

Reported: Jul 5, 1992

QUALITY CONTROL DATA REPORT

ANALYTE	Benzene	Toluene	Ethyl Benzene	Xylenes
Method:	EPA 8020	EPA 8020	EPA 8020	EPA 8020
Analyst:	C.Donohue	C.Donohue	C.Donohue	C.Donohue
Reporting Units:	mg/kg	mg/kg	mg/kg	mg/kg
Date Analyzed:	Jun 24, 1992	Jun 24, 1992	Jun 24, 1992	Jun 24, 1992
QC Sample #:	GBLK062492	GBLK062492	GBLK062492	GBLK062492
Sample Conc.:	N.D.	N.D.	N.D.	N.D.
Spike Conc. Added:	0.20	0.20	0.20	0.60
Conc. Matrix Spike:	0.18	0.17	0.18	0.52
Matrix Spike % Recovery:	90	85	90	87
Conc. Matrix Spike Dup.:	0.20	0.19	0.20	0.58
Matrix Spike Duplicate % Recovery:	100	95	100	97
Relative % Difference:	11	11	11	11

Quality Assurance Statement: All standard operating procedures and quality control requirements have been met.

SEQUOIA ANALYTICAL

Nokowhat D. Herrera
Project Manager

% Recovery:	Conc. of M.S. - Conc. of Sample / Spike Conc. Added	x 100
Relative % Difference:	Conc. of M.S. - Conc. of M.S.D. / (Conc. of M.S. + Conc. of M.S.D.) / 2	x 100

ARCO Products Company
Division of AtlanticRichfieldCompany

Task Order No. 4931-91-2

COPY

Chain of Custody

ARCO Facility no. 4931	City (Facility) OAKLAND	Project manager (Consultant) JOHN VALEGAS	Laboratory name SEQUOIA
ARCO engineer MICHAEL WHELAN	Telephone no. (ARCO) 415-571-7434	Telephone no. (Consultant) 510-352-4800	Fax no. (Consultant) 510-783-1089
Consultant name GeoSTRATEGIES INC.	Address (Consultant) 2140 W. WINTON AVE. HAYWARD.		Contract number 07-053

Method of shipment: COURIER

Sample I.D.	Lab no.	Container no.	Matrix: Soil	Matrix: Water	Matrix: Other	Preservation: Ice	Preservation: Acid	Sampling date	Sampling time	BTEX 602/EPA 8020	BTEX/TPH EPA M602/8020/8015	TPH Modified 8015 Gas ☐ Diesel ☐	Oil and Grease 413.1 ☐ 413.2 ☐	TPH EPA 418.1/SM503E	EPA 601/8010	EPA 624/8240	EPA 625/8270	TCLP Metals ☐ Semi VOA ☐ VOA ☐	CAM Metals EPA 6010/7000 TTLC ☐ STLC ☐	Lead Org./DHS ☐ Lead EPA 7420/7421 ☐		
A-13-4.5		1	X			X		6/16/92	10:01		X					4004						
A-13-10.0		1	X			X		6/16/92	10:17		X					4005						
AR-1-5.0		1	X			X		6/15/92	9:39		X					4006						
AR-1-10.0		1	X			X		6/15/92	10:01		X					4007						
AR-3-5.0		1	X			X		6/16/92	13:32		X					4008						

Special detection Limit/reporting: LOWEST POSSIBLE

Special QA/QC

Remarks

Lab number

Turnaround time

- Priority Rush 1 Business Day ☐
- Rush 2 Business Days ☐
- Expedited 5 Business Days ☐
- Standard 10 Business Days ☒

Condition of sample:

Temperature received:

	Date	Time		Date	Time
Relinquished by sampler: Robert C Mallory	6/22/92	9:00	Received by: Rebekah J. Hayes		
Relinquished by: Rebekah J. Hayes	6/22/92	9:30	Received by:		
Relinquished by:			Received by laboratory: K. Wellford	6/22/92	9:30AM

Distribution: White copy — Laboratory, Canary copy — ARCO Environmental Engineering; Pink copy — Consultant

APPENDIX C

GROUNDWATER ANALYTICAL REPORT AND CHAIN-OF-CUSTODY FORM

SEQUOIA ANALYTICAL

680 Chesapeake Drive • Redwood City, CA 94063
(415) 364-9600 • FAX (415) 364-9233

GENERAL CONTRACTORS

Gettler Ryan
2150 W. Winton Avenue
Hayward, CA 94545
Attention: John Vargas

Project: 3909.08, Arco 4931, Oakland

Enclosed are the results from 5 water samples received at Sequoia Analytical on July 2,1992. The requested analyses are listed below:

SAMPLE #	SAMPLE DESCRIPTION	DATE OF COLLECTION	TEST METHOD
2070551	Water, A-13	7/1/92	EPA 5030/8015/8020
2070552	Water, AR-1	7/1/92	EPA 5030/8015/8020
2070553	Water, AR-2	7/1/92	EPA 5030/8015/8020
2070554	Water, AR-3	7/1/92	EPA 5030/8015/8020
2070555	Water, Trip Blank	7/1/92	EPA 5030/8015/8020

Please contact me if you have any questions. In the meantime, thank you for the opportunity to work with you on this project.

Very truly yours,

SEQUOIA ANALYTICAL

Nokowhat D. Herrera
Project Manager

SEQUOIA ANALYTICAL

680 Chesapeake Drive • Redwood City, CA 94063
(415) 364-9600 • FAX (415) 364-9233

Gettler Ryan	Client Project ID:	3909.08, Arco 4931, Oakland	Sampled:	Jul 1, 1992
2150 W. Winton Avenue	Sample Matrix:	Water	Received:	Jul 2, 1992
Hayward, CA 94545	Analysis Method:	EPA 5030/8015/8020	Amended:	Jul 20, 1992
Attention: John Vargas	First Sample #:	207-0551		

TOTAL PURGEABLE PETROLEUM HYDROCARBONS with BTEX DISTINCTION

Analyte	Reporting Limit µg/L	Sample I.D. 207-0551 A-13	Sample I.D. 207-0552 AR-1	Sample I.D. 207-0553 AR-2	Sample I.D. 207-0554 AR-3	Sample I.D. 207-0555 Trip Blank	Sample I.D.
Purgeable Hydrocarbons	50	N.D.	2,300	N.D.	N.D.	N.D.	
Benzene	0.50	N.D.	260	N.D.	1.8	N.D.	
Toluene	0.50	N.D.	150	N.D.	0.86	N.D.	
Ethyl Benzene	0.50	N.D.	38	N.D.	N.D.	N.D.	
Total Xylenes	0.50	N.D.	470	N.D.	2.2	N.D.	
Chromatogram Pattern:		--	Gas	--	Gas	--	

Quality Control Data

Report Limit Multiplication Factor:	1.0	10	1.0	1.0	1.0
Date Analyzed:	7/7/92	7/7/92	7/7/92	7/7/92	7/7/92
Instrument Identification:	GCHP-2	GCHP-2	GCHP-2	GCHP-2	GCHP-2
Surrogate Recovery, %: (QC Limits = 70-130%)	104	110	100	97	91

Purgeable Hydrocarbons are quantitated against a fresh gasoline standard.
Analytes reported as N.D. were not detected above the stated reporting limit.

SEQUOIA ANALYTICAL

Nokowhat D. Herrera
Project Manager

SEQUOIA ANALYTICAL

680 Chesapeake Drive • Redwood City, CA 94063
(415) 364-9600 • FAX (415) 364-9233

Gettler Ryan
2150 W. Winton Avenue
Hayward, CA 94545
Attention: John Vargas

Client Project ID: 3909.08, Arco 4931, Oakland

QC Sample Group: 2070551 - 55

Reported: Jul 16, 1992

QUALITY CONTROL DATA REPORT

ANALYTE	Benzene	Toluene	Ethyl Benzene	Xylenes
Method:	EPA 8020	EPA 8020	EPA 8020	EPA 8020
Analyst:	J.Villar	J.Villar	J.Villar	J.Villar
Reporting Units:	µg/L	µg/L	µg/L	µg/L
Date Analyzed:	Jul 7, 1992	Jul 7, 1992	Jul 7, 1992	Jul 7, 1992
QC Sample #:	GBLK070792	GBLK070792	GBLK070792	GBLK070792
Sample Conc.:	N.D.	N.D.	N.D.	N.D.
Spike Conc. Added:	10	10	10	30
Conc. Matrix Spike:	9.6	9.5	9.6	29
Matrix Spike % Recovery:	96	95	96	97
Conc. Matrix Spike Dup.:	9.8	9.8	9.9	30
Matrix Spike Duplicate % Recovery:	98	98	99	100
Relative % Difference:	2.1	3.1	3.1	3.4

Quality Assurance Statement: All standard operating procedures and quality control requirements have been met.

SEQUOIA ANALYTICAL

Nokowhat D. Herrera
Project Manager

% Recovery:	Conc. of M.S. - Conc. of Sample / Spike Conc. Added	x 100
Relative % Difference:	Conc. of M.S. - Conc. of M.S.D. / (Conc. of M.S. + Conc. of M.S.D.) / 2	x 100

ARCO Products Company
Division of AtlanticRichfieldCompany

Task Order No. 4931-92-5

COPY

Chain of Custody

ARCO Facility no. 4931	City (Facility) Oakland	Project manager (Consultant) John Vargas	Laboratory name Sequoia
ARCO engineer Mike Whelan	Telephone no (ARCO)	Telephone no (Consultant) 783 7500	Fax no (Consultant) 783-1689
Consultant name Gettler-Ryan Inc	Address (Consultant) 2150 W. Winton Ave Hayward		Contract number 3909.08

Sample I.D.	Lab no	Container no.	Matrix: Soil	Matrix: Water	Matrix: Other	Preservation: Ice	Preservation: Acid	Sampling date	Sampling time	BTEX 602/EPA 8020	BTEX/TPH EPA M602/8020/8015	TPH Modified 8015 Gas ☐ Diesel ☐	Oil and Grease 413.1 ☐ 413.2 ☐	TPH EPA 418.1/SM503E	EPA 601/8010	EPA 624/8240	EPA 625/8270	TCLP Metals ☐ Semi VOA ☐ VOA ☐	CAM Metals EPA 6010/7000 TTLC ☐ STLC ☐	Lead Org./DHS ☐ Lead EPA 7420/7421 ☐		
A-13		3		✓			HCl	7-1-92	0839	✓		/			207		0551					
AR-1		↓		↓			↓	↓	1115	↓		↓					0552					
AR-2									1004								0553					
AR-3									1102								0554					
trip		1		↓			↓	↓	—	↓		↓				↓	0555					

Special detection Limit/reporting: Standard

Special QA/QC: Standard

Remarks: COC # 3909.08

Lab number:

Method of shipment: Cold

Turnaround time:
- Priority Rush 1 Business Day ☐
- Rush 2 Business Days ☐
- Expedited 5 Business Days ☐
- Standard 10 Business Days ☒

Condition of sample: Good

Temperature received: Cool

	Date	Time	Received by	Date	Time
Relinquished by sampler	7-1-92	1530	Retrig #1	7-1-92	1530
Relinquished by	7-2-92	0900			
Relinquished by	7-2-92	1715	Received by laboratory	7/2	1715

Distribution White copy — Laboratory, Canary copy — ARCO Environmental Engineering, Pink copy — Consultant

APPENDIX D

GETTLER-RYAN INC. FIELD DATA SHEETS

GETTLER–RYAN INC.

General and Environmental Contractors

OBSERVATION WELL DAILY MONITOR RECORD

COMPANY ARCO — JOB # 3909.08

LOCATION 731 W. MacArthur Blvd — DATE 7-1-92

CITY Oakland — TIME

WELL	DEPTH TO LIQUID (DTH) OR (DTW)	HYDROCARBON THICKNESS (HT) BEFORE	HYDROCARBON THICKNESS (HT) AFTER	AMOUNT PUMPED	COMMENTS
A-13	9.93	∅	29.4		sampled
AR-1	9.55	∅	29.5		
AR-2	10.82	∅	29.5		
AR-3	9.62	∅	29.3		↓

PRODUCT TANK: TOTAL FLOWMETER

WATER OTHER

COMMENTS

FOREMAN G. Sanf ASSISTANT

GETTLER-RYAN INC.

General and Environmental Contractors

WELL SAMPLING
FIELD DATA SHEET

COMPANY ARCO JOB # 3909.08

LOCATION 731 W. MacArthur Blvd DATE 7-1-92

CITY Oakland TIME

Well ID. A-13 Well Condition OK

Well Diameter 3 in. Hydrocarbon Thickness - ft.

Total Depth 29.4 ft.

Depth to Liquid- 9.93 ft.

Volume Factor (VF)			
	2" = 0.17	6" = 1.50	12" = 5.80
	3" = 0.38	8" = 2.60	
	4" = 0.66	10" = 4.10	

(# of casing volumes) 5 x 19.47 x(VF) .38 = (Estimated Purge Volume) 37.0 gal. (7.4)

Purging Equipment DI

Sampling Equipment Bailer

Starting Time 0822 Purging Flow Rate 3 gpm.

(Estimated Purge Volume) 37 gal. / (Purging Flow Rate) 3 gpm. = (Anticipated Purging Time) 12-3 min.

Time	pH	Conductivity	Temperature	Volume
0823	7.52	653	66.3	3 gal
0826	7.40	726	66.3	12 gal
0830	7.29	712	66.1	24 gal
0834	7.20	649	66.2	36 gal
0839	7.14	641	65.9	37 gal

Did well dewater? no If yes, time Volume

Sampling Time 0839 Weather Conditions P/C

Analysis THC (gas) BTXE Bottles Used 2x40ml

Chain of Custody Number

COMMENTS

FOREMAN G-Sam ASSISTANT

GETTLER-RYAN INC.

General and Environmental Contractors

WELL SAMPLING
FIELD DATA SHEET

COMPANY ARCO JOB # 3909.08

LOCATION 731 W. MacArthur Blvd DATE 7-1-92

CITY Oakland TIME

Well ID. AR-1 Well Condition OK

Well Diameter 6 in. Hydrocarbon Thickness - ft.

Total Depth 29.5 ft.

Depth to Liquid- 9.55 ft.

Volume Factor (VF)			
	2" = 0.17	6" = 1.50	12" = 5.80
	3" = 0.38	8" = 2.60	
	4" = 0.66	10" = 4.10	

(# of casing volumes) 5 x 19.95 x(VF) 1.5 = (Estimated Purge Volume) 149.6 gal. (29.9)

Purging Equipment DD

Sampling Equipment Bailer

Starting Time 0900 Purging Flow Rate 5 gpm.

(Estimated Purge Volume) 149.6 gal. / (Purging Flow Rate) 5 gpm. = (Anticipated Purging Time) 29.9 min.

Time	pH	Conductivity	Temperature	Volume
0901	7.35	651	65.5	5 gal
0910	7.19	649	65.5	50 gal
0912	7.15	586	65.8	60 gal
1115	6.98	574	65.7	61 gal

Did well dewater? Yes If yes, time 0912 Volume 60 gal

Sampling Time 1115 Weather Conditions P/C

Analysis gas BTXE Bottles Used 2x40ml

Chain of Custody Number

COMMENTS measured to top of casing *well recovered

FOREMAN G. Sanchez ASSISTANT

GETTLER-RYAN INC.

General and Environmental Contractors

WELL SAMPLING FIELD DATA SHEET

COMPANY ARCO JOB # 3909.08

LOCATION 731 W. MacArthur Blvd DATE 7-1-92

CITY Oakland TIME

Well ID. AR-2 Well Condition OK

Well Diameter 6 in. Hydrocarbon Thickness - ft.

Total Depth 29.5 ft.

Depth to Liquid- 10.82 ft.

Volume Factor (VF)			
	2" = 0.17	6" = 1.50	12" = 5.80
	3" = 0.38	8" = 2.60	
	4" = 0.66	10" = 4.10	

(# of casing volumes) 5 x 18.68 x(VF) 1.5 = (Estimated Purge Volume) 140.0 gal. (28.0)

Purging Equipment DI

Sampling Equipment Bailer

Starting Time 0930 Purging Flow Rate 5 gpm.

(Estimated Purge Volume) 140 gal. / (Purging Flow Rate) 5 gpm. = (Anticipated Purging Time) 28 min.

Time	pH	Conductivity	Temperature	Volume
0931	7.26	344	65.4	5 gal
0940	7.22	329	65.7	50 gal
0950	7.24	329	65.4	100 gal
0958	7.28	335	65.5	140 gal
1004	7.32	315	65.4	141 gal

Did well dewater? No If yes, time Volume

Sampling Time 1004 Weather Conditions P/C

Analysis Gas (BTXE) Bottles Used 2x40 ml

Chain of Custody Number

COMMENTS measured to top of casing

FOREMAN G. Sam ASSISTANT

GETTLER-RYAN INC.

General and Environmental Contractors

WELL SAMPLING
FIELD DATA SHEET

COMPANY ARCO JOB # 3905.0B

LOCATION 731 W. MacArthur Blvd DATE 7-1-92

CITY Oakland TIME

Well ID. AR-3 Well Condition OK

Well Diameter 4 in. Hydrocarbon Thickness ~ ft.

Total Depth 29.3 ft.

Depth to Liquid- 9.62 ft.

Volume Factor (VF)			
	2" = 0.17	6" = 1.50	12" = 5.80
	3" = 0.38	8" = 2.60	
	4" = 0.66	10" = 4.10	

(# of casing volumes) 5 x 19.68 x(VF) .66 = (Estimated Purge Volume) 65.0 gal. (13)

Purging Equipment DD

Sampling Equipment Bailer

Starting Time 1040 Purging Flow Rate 4 gpm.

(Estimated Purge Volume) 65 gal. / (Purging Flow Rate) 4 gpm. = (Anticipated Purging Time) 16.3 min.

Time	pH	Conductivity	Temperature	Volume
1041	7.18	830	64.6	4 gal
1046	7.20	565	63.5	24 gal
1051	7.18	522	63.5	44 gal
1056	7.12	515	63.4	64 gal
1102	7.02	587	63.7	65 gal

Did well dewater? NO If yes, time Volume

Sampling Time 1102 Weather Conditions F/C

Analysis gas (BTXE) Bottles Used 2x40 ml

Chain of Custody Number

COMMENTS measured to top of casing

FOREMAN G-Sand ASSISTANT

APPENDIX E

EMCON GROUND-WATER SAMPLING REPORT

EMCON ASSOCIATES
Consultants in Wastes Management and Environmental Control

RECEIVED
SEP 10 1992
GeoStrategies Inc.

Date August 26, 1992
Project G70-32.01

To:
Mr. John Vargas
GeoStrategies, Inc.
2140 West Winton Avenue
Hayward, California 94545

We are enclosing:

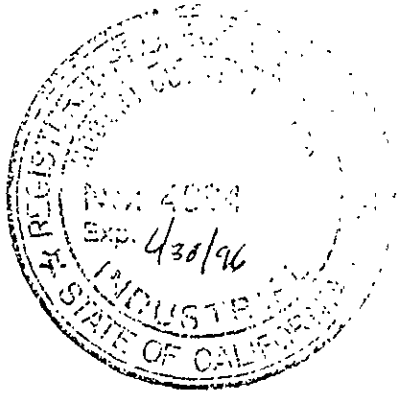
Copies	Description
1	Depth To Water / Floating Product Survey Results
1	Summary of Groundwater Monitoring Data
1	Certified Analytical Reports with Chain-of-Custody
15	Water Sample Field Data Sheets

For your: X Information Sent by: X Mail

Comments:

Enclosed are the data from the third quarter 1992 monitoring event at ARCO service station 4931, 731 West MacArthur Boulevard, Oakland, CA. Groundwater monitoring is conducted consistent with applicable regulatory guidelines. Please call if you have any questions: (408) 453-2266.

Reviewed by: Jim Butera JB



Robert Porter, Senior Project Engineer.

1938 Junction Avenue, San Jose, California 95131-2102, (408) 453-0719, Fax (408) 453-0452

Summary of Groundwater Monitoring Data
Third Quarter 1992
ARCO Service Station 4931
731 West MacArthur Boulevard, Oakland, California
micrograms per liter (µg/l) and milligrams per liter (mg/l)

Well ID and Sample Depth	Sampling Date	Depth To Water (feet)	Floating Product Thickness (feet)	TPH[1] as Gasoline (µg/l)	Benzene (µg/l)	Toluene (µg/l)	Ethyl-benzene (µg/l)	Total Xylenes (µg/l)
AR-1(30)	07/29/92	11.32	ND[2]	1,600.	340.	180.	52.	320.
AR-2(27)	07/29/92	11.90	ND	350.	130.	8.5	<0.50	<0.50
AR-3(29)	07/29/92	11.55	ND	<50	1.6	<0.50	<0.50	<0.50
A-2(19.5)	07/30/92	11.81	ND	590.	10.	<0.50	<0.50	<0.50
A-3(17)	07/30/92	11 59	ND	<50	<0.50	<0.50	<0.50	<0.50
A-4	NS.[3]	11.74	0.04	NS.	NS.	NS.	NS.	NS.
A-5(24)	07/30/92	11.46	ND	<50	<0.50	<0.50	<0.50	<0.50
A-6(24)	07/30/92	10.40	ND	<50	0.64	<0.50	<0.50	<0.50
A-7(22)	07/29/92	10.09	ND	<50	<0.5	<0.50	<0.50	<0.50
A-8	NS.	11.33	0.06	NS.	NS.	NS.	NS.	NS
A-9(38.5)	07/30/92	10.43	ND	<50	14.	<0.50	1.7	6.0
A-10(30)	07/29/92	11.84	ND	<50	25.	<0.50	<0.50	1.8
A-11(28)	07/30/92	11.33	ND	<50	<0.50	<0.50	<0.50	<0.50
A-12(28)	07/30/92	10.81	ND	<50	<0.50	<0.50	<0.50	<0.50
A-13(29)	07/30/92	11.12	ND	<50	<0.50	<0.50	<0.50	<0.50
XDup[4]	07/30/92	NA.[5]	ND	1,100.	17.	<0.5	5.4	12.
FB-1[6]	07/30/92	NA.	NA	<50	<0.50	<0.50	<0.50	<0.50
TB-1[7]	07/30/92	NA.	NA	<50	<0.50	<0.50	<0.50	<0.50

1. TPH = *Total petroleum hydrocarbons*
2. ND = Not detected
3. NS = Not sampled; well was not sampled due to detection of floating product
4. XDup = Duplicate well sample collected at well A-2
5. NA = Not applicable
6. FB = Field Blank
7. TB = Trip Blank

FIELD REPORT
DEPTH TO WATER / FLOATING PRODUCT SURVEY

PROJECT # : G70-32.01 STATION ADDRESS : 731 West MacArthur Blvd. Oakland, DATE : July 29, 1992

ARCO STATION # : 4931 FIELD TECHNICIAN : Williams, Reichelderfer, Horton DAY : Wednesday

DTW Order	WELL ID	Well Box Seal	Well Lid Secure	Gasket	Lock	Locking Well Cap	FIRST DEPTH TO WATER (feet)	SECOND DEPTH TO WATER (feet)	DEPTH TO FLOATING PRODUCT (feet)	FLOATING PRODUCT THICKNESS (feet)	WELL TOTAL DEPTH (feet)	COMMENTS
1	AR-1	good	yes	good	2268	good	11.32	11.32	ND	ND	30.20	—
2	AR-2	good	yes	good	2268	good	11.90	11.90	ND	ND	27.50	—
3	AR-3	good	yes	good	2268	good	11.55	11.55	ND	ND	29.90	—
4	A-13	good	yes	good	2268	good	11.12	11.13	ND	ND	29.40	—
5	A-7	good	yes	good	2268	good	10.09	10.09	ND	ND	22.90	—
6	A-11	GOOD	YES	OK NO	2268	OK	11.33	11.33	ND	ND	28.0	Inaccessable Due To Road
7	A-12	GOOD	YES	NO	2008	OK	10.81	10.81	ND	ND	28.9	Construction Rerouting Of Traffic 7 29-92
8	A-10	good	yes	good	2268	good	11.84	11.84	ND	ND	30.20	—
9	A-5	good	yes	good	2008	good	11.46	11.46	ND	ND	24.00	—
10	A-6	good	yes	good	2008	broken	10.40	10.41	ND	ND	24.90	Metal Locking Cap Broken
11	A-9	good	yes	good	Needs New Lock	good	10.43	10.43	ND	ND	38.60	—
12	A-3	good	yes	good	2268	good	11.59	11.60	ND	ND	17.10	—
13	A-2	good	yes	good	Needs New Lock	good	11.81	11.81	ND	ND	19.80	—
14	A-4	good	yes	good	Needs New Lock	good	11.74	11.74	ND	ND	19.90	Product Not Detected w/ MMC. Gi measured w/ teflon bailer

SURVEY POINTS ARE TOP OF WELL BOXES

FIELD REPORT
DEPTH TO WATER / FLOATING PRODUCT SURVEY

PROJECT # : G70-32.01 STATION ADDRESS : 731 West MacArthur Blvd. Oakland, DATE : July 29, 1992

ARCO STATION # : 4931 FIELD TECHNICIAN : Williams/Reichelderfer/Horton DAY : Wednesday

DTW Order	WELL ID	Well Box Seal	Well Lid Secure	Gasket	Lock	Locking Well Cap	FIRST DEPTH TO WATER (feet)	SECOND DEPTH TO WATER (feet)	DEPTH TO FLOATING PRODUCT (feet)	FLOATING PRODUCT THICKNESS (feet)	WELL TOTAL DEPTH (feet)	COMMENTS
15	A-8	good	yes	good	2008	good	11.33	11.33	Nil	ND	20.10	Product { Not detected w/ PHC 10 min in skimmer Will monitor w/ teflon bailer

SURVEY POINTS ARE TOP OF WELL BOXES

SEQUOIA ANALYTICAL

680 Chesapeake Drive • Redwood City, CA 94063
(415) 364-9600 • FAX (415) 364-9233

Emcon Associates
1938 Junction Avenue
San Jose, CA 95131
Attention: Jim Butera

Project: Arco 4931

Enclosed are the results from 16 water samples received at Sequoia Analytical on July 31,1992. The requested analyses are listed below:

SAMPLE #	SAMPLE DESCRIPTION	DATE OF COLLECTION	TEST METHOD
2075261	Water, AR-1(30)	7/29/92	EPA 5030/8015/8020
2075262	Water, AR-2(27)	7/29/92	EPA 5030/8015/8020
2075263	Water, AR-3(29)	7/29/92	EPA 5030/8015/8020
2075264	Water, A-2(19.5)	7/30/92	EPA 5030/8015/8020
2075265	Water, A-3(17)	7/30/92	EPA 5030/8015/8020
2075266	Water, A-5(24)	7/30/92	EPA 5030/8015/8020
2075267	Water, A-6(24)	7/30/92	EPA 5030/8015/8020
2075268	Water, A-7(22)	7/29/92	EPA 5030/8015/8020
2075269	Water, A-9(38.5)	7/30/92	EPA 5030/8015/8020
2075270	Water, A-10(30)	7/29/92	EPA 5030/8015/8020
2075271	Water, A-11(28)	7/30/92	EPA 5030/8015/8020
2075272	Water, A-12(28)	7/30/92	EPA 5030/8015/8020
2075273	Water, A-13(29)	7/29/92	EPA 5030/8015/8020
2075274	Water, X-Dup.	7/30/92	EPA 5030/8015/8020
2075275	Water, FB-1	7/30/92	EPA 5030/8015/8020
2075276	Water, TB-1	7/30/92	EPA 5030/8015/8020

Please contact me if you have any questions. In the meantime, thank you for the opportunity to work with you on this project.

Very truly yours,

SEQUOIA ANALYTICAL

Maile A. Springer
Project Manager

SEQUOIA ANALYTICAL

680 Chesapeake Drive • Redwood City, CA 94063
(415) 364-9600 • FAX (415) 364-9233

Emcon Associates	Client Project ID:	Arco 4931	Sampled: 7/29-30/92
1938 Junction Avenue	Sample Matrix:	Water	Received: Jul 31, 1992
San Jose, CA 95131	Analysis Method:	EPA 5030/8015/8020	Reported: Aug 17, 1992
Attention: Jim Butera	First Sample #:	207-5261	

TOTAL PURGEABLE PETROLEUM HYDROCARBONS with BTEX DISTINCTION

Analyte	Reporting Limit µg/L	Sample I.D. 207-5261 AR-1(30)	Sample I.D. 207-5262 AR-2(27)	Sample I.D. 207-5263 AR-3(29)	Sample I.D. 207-5264 A-2(19.5)	Sample I.D. 207-5265 A-3(17)	Sample I.D. 207-5266 A-5(24)
Purgeable Hydrocarbons	50	1,600	350	N.D.	590	N.D.	N.D.
Benzene	0.50	340	130	1.6	10	N.D.	N.D.
Toluene	0.50	180	8.5	N.D.	N.D.	N.D.	N.D.
Ethyl Benzene	0.50	52	N.D.	N.D.	N.D.	N.D.	N.D.
Total Xylenes	0.50	320	N.D.	N.D.	9.0	N.D.	N.D.
Chromatogram Pattern:		Gas	Non-Gas Mixture < C8	Discrete Peaks	Gas	--	--

Quality Control Data

Report Limit Multiplication Factor:	10	20	1.0	4.0	1.0	1.0
Date Analyzed:	8/4/92	8/5/92	8/4/92	8/5/92	8/4/92	8/4/92
Instrument Identification:	GCHP-3	GCHP-3	GCHP-3	GCHP-3	GCHP-3	GCHP-3
Surrogate Recovery, %: (QC Limits = 70-130%)	118	103	94	119	90	95

Purgeable Hydrocarbons are quantitated against a fresh gasoline standard.
Analytes reported as N.D. were not detected above the stated reporting limit.

SEQUOIA ANALYTICAL

Maile A. Springer
Project Manager

SEQUOIA ANALYTICAL

680 Chesapeake Drive • Redwood City, CA 94063
(415) 364-9600 • FAX (415) 364-9233

Emcon Associates	Client Project ID:	Arco 4931	Sampled:	7/29-30/92
1938 Junction Avenue	Sample Matrix:	Water	Received:	Jul 31, 1992
San Jose, CA 95131	Analysis Method:	EPA 5030/8015/8020	Reported:	Aug 17, 1992
Attention: Jim Butera	First Sample #:	207-5267		

TOTAL PURGEABLE PETROLEUM HYDROCARBONS with BTEX DISTINCTION

Analyte	Reporting Limit µg/L	Sample I.D. 207-5267 A-6(24)	Sample I.D. 207-5268 A-7(22)	Sample I.D. 207-5269 A-9(38.5)	Sample I.D. 207-5270 A-10(30)	Sample I.D. 207-5271 A-11(28)	Sample I.D. 207-5272 A-12(28)
Purgeable Hydrocarbons	50	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
Benzene	0.50	0.64	N.D.	14	25	N.D.	N.D.
Toluene	0.50	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
Ethyl Benzene	0.50	N.D.	N.D.	1.7	N.D.	N.D.	N.D.
Total Xylenes	0.50	N.D.	N.D.	6.0	1.8	N.D.	N.D.
Chromatogram Pattern:		Discrete Peaks	--	Gas Peaks	Discrete Peaks	--	--

Quality Control Data

Report Limit Multiplication Factor:	1.0	1.0	1.0	1.0	1.0	1.0
Date Analyzed:	8/4/92	8/4/92	8/4/92	8/4/92	8/4/92	8/4/92
Instrument Identification:	GCHP-3	GCHP-3	GCHP-3	GCHP-3	GCHP-3	GCHP-3
Surrogate Recovery, %: (QC Limits = 70-130%)	100	102	101	100	89	105

Purgeable Hydrocarbons are quantitated against a fresh gasoline standard.
Analytes reported as N.D. were not detected above the stated reporting limit.

SEQUOIA ANALYTICAL

Maile A. Springer
Project Manager

SEQUOIA ANALYTICAL

680 Chesapeake Drive • Redwood City, CA 94063
(415) 364-9600 • FAX (415) 364-9233

Emcon Associates	Client Project ID:	Arco 4931	Sampled: 7/29-30/92
1938 Junction Avenue	Sample Matrix:	Water	Received: Jul 31, 1992
San Jose, CA 95131	Analysis Method:	EPA 5030/8015/8020	Amended: Sep 8, 1992
Attention: Jim Butera	First Sample #:	207-5273	

TOTAL PURGEABLE PETROLEUM HYDROCARBONS with BTEX DISTINCTION

Analyte	Reporting Limit µg/L	Sample I.D. 207-5273 A-13(29)	Sample I.D. 207-5274 X-Dup.	Sample I.D. 207-5275 FB-1	Sample I.D. 207-5276 TB-1	Sample I.D.	Sample I.D.
Purgeable Hydrocarbons	50	N.D.	1,100	N.D.	N.D.		
Benzene	0.50	N.D.	17	N.D.	N.D.		
Toluene	0.50	N.D.	N.D.	N.D.	N.D.		
Ethyl Benzene	0.50	N.D.	5.4	N.D.	N.D.		
Total Xylenes	0.50	N.D.	12	N.D.	N.D.		
Chromatogram Pattern:		--	Gas	--	--		

Quality Control Data

Report Limit Multiplication Factor:	1.0	4.0	1.0	1.0
Date Analyzed:	8/4/92	8/5/92	8/4/92	8/4/92
Instrument Identification:	GCHP-3	GCHP-3	GCHP-3	GCHP-3
Surrogate Recovery, %: (QC Limits = 70-130%)	101	126	80	72

Purgeable Hydrocarbons are quantitated against a fresh gasoline standard.
Analytes reported as N.D. were not detected above the stated reporting limit.

SEQUOIA ANALYTICAL

Maile A. Springer
Project Manager

SEQUOIA ANALYTICAL

680 Chesapeake Drive • Redwood City, CA 94063
(415) 364-9600 • FAX (415) 364-9233

Emcon Associates
1938 Junction Avenue
San Jose, CA 95131
Attention: Jim Butera

Client Project ID: Arco 4931

QC Sample Group: 2075261, 63, 65-73, 75-76

Reported: Aug 14, 1992

QUALITY CONTROL DATA REPORT

ANALYTE	Benzene	Toluene	Ethyl Benzene	Xylenes
Method:	EPA 8020	EPA 8020	EPA 8020	EPA 8020
Analyst:	J.Villar	J.Villar	J.Villar	J.Villar
Reporting Units:	mg/L	mg/L	mg/L	mg/L
Date Analyzed:	Aug 4, 1992	Aug 4, 1992	Aug 4, 1992	Aug 4, 1992
QC Sample #:	GBLK080492	GBLK080492	GBLK080492	GBLK080492
Sample Conc.:	N.D.	N.D.	N.D.	N.D.
Spike Conc. Added:	10	10	10	30
Conc. Matrix Spike:	11	11	11	33
Matrix Spike % Recovery:	110	110	110	110
Conc. Matrix Spike Dup.:	9.9	9.6	10	30
Matrix Spike Duplicate % Recovery:	99	96	100	100
Relative % Difference:	11	14	9.5	9.5

Quality Assurance Statement: All standard operating procedures and quality control requirements have been met.

SEQUOIA ANALYTICAL

Maile A. Springer
Project Manager

% Recovery:	$\frac{\text{Conc. of M.S. - Conc. of Sample}}{\text{Spike Conc. Added}}$	x 100
Relative % Difference:	$\frac{\text{Conc. of M.S. - Conc. of M.S.D.}}{\text{(Conc. of M.S + Conc. of M.S.D.) / 2}}$	x 100

SEQUOIA ANALYTICAL
680 Chesapeake Drive • Redwood City, CA 94063
(415) 364-9600 • FAX (415) 364-9233

Emcon Associates
1938 Junction Avenue
San Jose, CA 95131
Attention: Jim Butera

Client Project ID: Arco 4931

QC Sample Group: 2075262, 64, 74

Reported: Aug 14, 1992

QUALITY CONTROL DATA REPORT

ANALYTE	Benzene	Toluene	Ethyl Benzene	Xylenes
Method:	EPA 8020	EPA 8020	EPA 8020	EPA 8020
Analyst:	J.Villar	J.Villar	J.Villar	J.Villar
Reporting Units:	mg/L	mg/L	mg/L	mg/L
Date Analyzed:	Aug 5, 1992	Aug 5, 1992	Aug 5, 1992	Aug 5, 1992
QC Sample #:	GBLK080592	GBLK080592	GBLK080592	GBLK080592
Sample Conc.:	N.D.	N.D.	N.D.	N.D.
Spike Conc. Added:	10	10	10	30
Conc. Matrix Spike:	9.1	9.4	9.0	27
Matrix Spike % Recovery:	91	94	90	90
Conc. Matrix Spike Dup.:	9.8	9.9	9.9	30
Matrix Spike Duplicate % Recovery:	98	99	99	100
Relative % Difference:	7.4	5.2	9.5	11

Quality Assurance Statement: All standard operating procedures and quality control requirements have been met.

SEQUOIA ANALYTICAL

Maile A. Springer
Project Manager

% Recovery:	Conc. of M.S. - Conc. of Sample / Spike Conc. Added	x 100
Relative % Difference:	Conc. of M.S. - Conc. of M.S.D. / (Conc. of M.S. + Conc. of M.S.D.) / 2	x 100

ARCO Products Company
Division of AtlanticRichfieldCompany

Task Order No. EMCEC-92-1

COPY

Chain of Custody

ARCO Facility no 4931	City (Facility) OAKLAND	Project manager (Consultant) JIM BUTLER	Laboratory name SEQUOIA
ARCO engineer KYLE CHRISTIE	Telephone no. (ARCO) (415) 571-2454	Telephone no. (Consultant) (408) 453-0719	Fax no. (Consultant) (408) 453-0452
Consultant name EMCON ASSOCIATES	Address (Consultant) 1933 JUNCTION AVE SAN JOSE		Contract number

Method of shipment: Courier will pick up

Sample I.D	Lab no	Container no	Matrix: Soil	Matrix: Water	Matrix: Other	Preservation: Ice	Preservation: Acid	Sampling date	Sampling time	BTEX 602/EPA 8020	BTEX/TPH G/S EPA M602/8020/8015	TPH Modified 8015 Gas ☐ Diesel ☐	Oil and Grease 413.1 ☐ 413.2 ☐	TPH EPA 418.1/SM503E	EPA 601/8010	EPA 624/8240	EPA 625/8270	TCLP Metals ☐ VOA ☐ Semi VOA ☐	CAM Metals EPA 6010/7000 TTLC ☐ STLC ☐	Lead Org./DHS ☐ Lead EPA 7420/7421 ☐	
AR-1(30)		2		X		X	HCl	7-29-92	1252		X								20	15	26
AR-2(27)		2		X		X		7-29-92	1355		X										62
AR-3(29)		2		X		X		7-29-92	1450		X										63
A-2(19.5)		2		X		X		7-30-92	1050		X										64
A-3(17)		2		X		X		7-30-92	1529		X										65
A-4( )		2		X		X					X	PRODUCT IN WELL, NO SAMPLE									
A-5(24)		2		X		X		7-30-92	1338		X										66
A-6(24)		2		X		X		7-30-92	1337		X										67
A-7(22)		2		X		X		7-29-92	1555		X										68
A-8( )		2		X		X					X	PRODUCT IN WELL, NO SAMPLE									
A-9(33.5)		2		X		X		7-30-92	1440		X										69
A-10(30)		2		X		X		7-29-92	1550		X										70
A-11(28)		2		X		X		7-30-92	1145		X										71
A-12(28)		2		X		X		7-30-92	1218		X										72
A-13(29)		2		X		X	↓	7-29-92	1510		X									↓	73

Special detection Limit/reporting: Lowest Possible

Special QA/QC: As Normal

Remarks: 2 40ml HCl VOA's per well (Sequoia Bottles)

Lab number

Turnaround time

- Priority Rush 1 Business Day [ ]
- Rush 2 Business Days [ ]
- Expedited 5 Business Days [ ]
- Standard 10 Business Days [X]

Condition of sample		Temperature received:
Relinquished by sampler: Kim Stichdichter	Date 7-30-92 Time 1735	Received by: JB.
Relinquished by: J Butler	Date 7-31-92 Time 1045	Received by: Mark Ellen 7-31-92 1:45
Relinquished by: Mark Ellen	Date 7-31-92 Time 242	Received by laboratory: Date: Time:

Distribution White copy — Laboratory, Canary copy — ARCO Environmental Engineering; Pink copy — Consultant

APPC-3292 (2-91)

ARCO Products Company
Division of AtlanticRichfieldCompany

Task Order No. EMCEC-92-1

COPY

Chain of Custody

ARCO Facility no 4931	City (Facility) OAKLAND	Project manager (Consultant) Jim Butera	Laboratory name SEQUOIA
ARCO engineer Kyle Christie	Telephone no (ARCO) (415) 871-2434	Telephone no (Consultant) (408) 453-0719	Fax no (Consultant) (408) 453-0452
Consultant name EMCON ASSOCIATES	Address (Consultant) 1938 Junction Ave San Jose		Contract number

Sample ID	Lab no.	Container no.	Matrix: Soil	Matrix: Water	Matrix: Other	Preservation: Ice	Preservation: Acid	Sampling date	Sampling time	BTEX 602/EPA 8020	BTEX/TPH EPA M602/8020/8015	TPH Modified 8015 Gas ☐ Diesel ☐	Oil and Grease 413.1 ☐ 413.2 ☐	TPH EPA 418.1/SM503E	EPA 601/8010	EPA 624/8240	EPA 625/8270	TCLP Metals ☐ VOA ☐ Semi VOA ☐	CAM Metals EPA 6010/7000 TTLC ☐ STLC ☐	Lead Org./DHS ☐ Lead EPA 7420/7421 ☐		
XDUP		2		X		X	HCl	7-30-92			X								2075	274		
FB-1		2		X		X	HCl	7-30-92	1345		X										75	
TB-1		2		X		X	HCl	7-30-92			X										76	

Method of shipment: Courier will Pick up

Special detection Limit/reporting: lowest feasible

Special QA/QC: A3 Normal

Remarks: 2-40 ml HCl VOA's per Sample (Sequoia Bottles)

Lab number

Turnaround time

- Priority Rush 1 Business Day [ ]
- Rush 2 Business Days [ ]
- Expedited 5 Business Days [ ]
- Standard 10 Business Days [X]

Condition of sample		Temperature received	
Relinquished by sampler: Kevin Reichlefer	Date 7-30-92 Time 1735	Received by: VB	
Relinquished by: J Butera	Date 7-31-92 Time 1345	Received by: Mark A. Ellis	7-31-92 1:45
Relinquished by: Mark A. Ellis	Date 7-31-92 Time 2:12	Received by laboratory	Date Time

Distribution: White copy -- Laboratory; Canary copy — ARCO Environmental Engineering; Pink copy – Consultant

WATER SAMPLE FIELD DATA SHEET

Rev. 2, 5/91

EMCON ASSOCIATES

PROJECT NO: 670-32.01 | SAMPLE ID: A-2 (19.5)

PURGED BY: K REICHELDERFER | CLIENT NAME: ARCO 4931

SAMPLED BY: ↓ | LOCATION: 731 W. MacARTHUR BLVD., OAKLAND

TYPE: Ground Water X | Surface Water ___ | Treatment Effluent ___ | Other ___

CASING DIAMETER (inches): 2 ___ 3 ___ 4 X 4.5 ___ 6 ___ Other ___

CASING ELEVATION (feet/MSL):	NR	VOLUME IN CASING (gal.):	5.24
DEPTH TO WATER (feet):	11.81	CALCULATED PURGE (gal.):	26.21
DEPTH OF WELL (feet):	19.8	ACTUAL PURGE VOL. (gal.):	6.00

DATE PURGED: 7-29-92 | Start (2400 Hr): 1130 | End (2400 Hr): 1133

DATE SAMPLED: 7-30-92 | Start (2400 Hr): 1150 | End (2400 Hr): 1205

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
1132 (1st)	5.50	6.07	761	67.1	DK GREY	HEAVY
1132	WELL DRIED @	6.00 GALLONS				
1148 (2nd)	RECHARGE	6.29	665	67.3	LT BROWN	MODERATE

D. O. (ppm): NR | ODOR: STRONG | NR (COBALT 0 - 100) | NR (NTU 0 - 200)

FIELD QC SAMPLES COLLECTED AT THIS WELL (i.e. FB-1, XDUP-1): X DUP

PURGING EQUIPMENT		SAMPLING EQUIPMENT	
___ 2" Bladder Pump	___ Bailer (Teflon®)	___ 2" Bladder Pump	X Bailer (Teflon®)
X Centrifugal Pump	___ Bailer (PVC)	___ DDL Sampler	___ Bailer (Stainless Steel)
___ Submersible Pump	___ Bailer (Stainless Steel)	___ Dipper	___ Submersible Pump
___ Well Wizard™	___ Dedicated	___ Well Wizard™	___ Dedicated
Other: ___		Other: ___	

WELL INTEGRITY: OK | LOCK #: 2008

REMARKS: DRIED WELL @ 6.00 GALLONS, 7-29-92 (1133)
RETURNED 7-30-92 TO SAMPLE (1050) & GET RECHARGE READING

Meter Calibration: Date: 7-30-92 Time: 1045 Meter Serial #: 1203 Temperature °F: 69.6

(EC 1000 1001 / 1000) (DI ___) (pH 7 7.31 / 7.00) (pH 10 10.07 / 10.00) (pH 4 3.13 / ___)

Location of previous calibration: ___

Signature: [signature] Reviewed By: [signature] Page 1 of 15

WATER SAMPLE FIELD DATA SHEET

Rev. 2, 5/91

EMCON ASSOCIATES

PROJECT NO: 4970-32.01 SAMPLE ID: A-3 (17)

PURGED BY: K REICHELDERFER CLIENT NAME: ARCO 4931

SAMPLED BY: ↓ LOCATION: 731 W. MacARTHUR BLVD., OAKLAND

TYPE: Ground Water X Surface Water ___ Treatment Effluent ___ Other ___

CASING DIAMETER (inches): 2 ___ 3 ___ 4 X 4.5 ___ 6 ___ Other ___

CASING ELEVATION (feet/MSL):	NR	VOLUME IN CASING (gal.):	3.58
DEPTH TO WATER (feet):	11.65	CALCULATED PURGE (gal.):	17.88
DEPTH OF WELL (feet):	17.1	ACTUAL PURGE VOL. (gal.):	4.50

DATE PURGED: 7-30-92 Start (2400 Hr) 1508 End (2400 Hr) 1512

DATE SAMPLED: 7-30-92 Start (2400 Hr) 1529 End (2400 Hr) 1531

TIME (2400 Hr)	VOLUME (gal)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
1510	4.00	6.86	976	70.4	DK BROWN	HEAVY
1512	WELL DRIED @ 4.50 GALLONS					
1533	RECHARGE	6.83	940	68.6		

D. O. (ppm): NR ODOR: NONE COLOR: NR (COBALT 0 - 100) TURBIDITY: NR (NTU 0 - 200)

FIELD QC SAMPLES COLLECTED AT THIS WELL (i.e. FB-1, XDUP-1): NR

PURGING EQUIPMENT		SAMPLING EQUIPMENT	
___ 2" Bladder Pump	___ Bailer (Teflon®)	___ 2" Bladder Pump	X Bailer (Teflon®)
X Centrifugal Pump	___ Bailer (PVC)	___ DDL Sampler	___ Bailer (Stainless Steel)
___ Submersible Pump	___ Bailer (Stainless Steel)	___ Dipper	___ Submersible Pump
___ Well Wizard™	___ Dedicated	___ Well Wizard™	___ Dedicated
Other: ___		Other: ___	

WELL INTEGRITY: GOOD LOCK #: 2268

REMARKS: WELL DRIED @ 4.50 GALLONS (1512)

Meter Calibration: Date: 7-30-92 Time: 1502 Meter Serial #: 9203 Temperature °F: 70.3

(EC 1000 1009 / 1000) (DI ___) (pH 7 7.06 / 7.00) (pH 10 9.98 / 10.00) (pH 4 3.92 / ___)

Location of previous calibration: ___

Signature: [signature] Reviewed By: JB Page 2 of 15

WATER SAMPLE FIELD DATA SHEET

Rev. 2, 5/91

EMCON ASSOCIATES

PROJECT NO: G70-32.01 SAMPLE ID: A-4

PURGED BY: STEVE HORTON / CLIENT NAME: ARCO 4931

SAMPLED BY: REICHELDEIZER LOCATION: 731 W. MacARTHUR BLVD., OAKLAND

TYPE: Ground Water X Surface Water ___ Treatment Effluent ___ Other ___

CASING DIAMETER (inches): 2 ___ 3 ___ 4 X 4.5 ___ 6 ___ Other ___

CASING ELEVATION (feet/MSL):	NR	VOLUME IN CASING (gal.):	NA
DEPTH TO WATER (feet):	11.74	CALCULATED PURGE (gal.):	NA
DEPTH OF WELL (feet):	19.9	ACTUAL PURGE VOL. (gal.):	NA

DATE PURGED: 7-29-92 Start (2400 Hr) ___ End (2400 Hr) ___

DATE SAMPLED: ___ Start (2400 Hr) ___ End (2400 Hr) ___

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
	PRODUCT	IN	WELL			

D. O. (ppm): ___ ODOR: ___ (COBALT 0 - 100) (NTU 0 - 200)

FIELD QC SAMPLES COLLECTED AT THIS WELL (i.e. FB-1, XDUP-1): ___

PURGING EQUIPMENT		SAMPLING EQUIPMENT	
___ 2" Bladder Pump	___ Bailer (Teflon®)	___ 2" Bladder Pump	___ Bailer (Teflon®)
___ Centrifugal Pump	___ Bailer (PVC)	___ DDL Sampler	___ Bailer (Stainless Steel)
___ Submersible Pump	___ Bailer (Stainless Steel)	___ Dipper	___ Submersible Pump
___ Well Wizard™	___ Dedicated	___ Well Wizard™	___ Dedicated
Other: ___		Other: ___	

WELL INTEGRITY: ___ LOCK #: 3263

REMARKS: MMC DIDN'T DETECT PRODUCT YET O.G.I' IN TEFLON BAILER. NEW LOCK INSTALLED AFTER DIFFICULT ATTEMPTS TO UNLOCK EXISTING. (WOULD HAVE TO CUT LOCK)

Meter Calibration: Date: ___ Time: ___ Meter Serial #: ___ Temperature °F: ___

(EC 1000 ___ / ___) (DI ___) (pH 7 ___ / ___) (pH 10 ___ / ___) (pH 4 ___ / ___)

Location of previous calibration: ___

Signature: Kevin Reichelderfer Reviewed By: ___ Page 3 of 15

WATER SAMPLE FIELD DATA SHEET

Rev. 2, 5/91

EMCON ASSOCIATES

PROJECT NO: 4170-32.01 | SAMPLE ID: A-5(24)

PURGED BY: K REICHELDERFER | CLIENT NAME: ARCO 4931

SAMPLED BY: ↓ | LOCATION: 731 W MacARTHUR BL. OAKLAND

TYPE: Ground Water X | Surface Water ___ | Treatment Effluent ___ | Other ___

CASING DIAMETER (inches): 2 ___ | 3 X | 4 ___ | 4.5 ___ | 6 ___ | Other ___

CASING ELEVATION (feet/MSL):	NR	VOLUME IN CASING (gal.):	4.67
DEPTH TO WATER (feet):	11.44	CALCULATED PURGE (gal.):	23.36
DEPTH OF WELL (feet):	24.0	ACTUAL PURGE VOL. (gal.):	23.50

DATE PURGED: 7-30-92 | Start (2400 Hr) 1308 | End (2400 Hr) 1331

DATE SAMPLED: 7-30-92 | Start (2400 Hr) 1338 | End (2400 Hr) 1340

TIME (2400 Hr)	VOLUME (gal)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
1311	5.00	6.80	919	68.9	BROWN	HEAVY
1316	10.00	6.64	834	67.3	"	"
1326	15.00	6.62	767	66.9	"	"
1326	20.00	6.67	758	66.7	"	"
1331	23.50	6.65	719	66.3	↓	↓

D. O. (ppm): NR | ODOR: SLIGHT | COLOR: NR (COBALT 0 - 100) | TURBIDITY: HEAVY (NTU 0 - 200)

FIELD QC SAMPLES COLLECTED AT THIS WELL (i.e. FB-1, XDUP-1): ~~NR~~ FB-1

PURGING EQUIPMENT		SAMPLING EQUIPMENT	
___ 2" Bladder Pump	___ Bailer (Teflon®)	___ 2" Bladder Pump	X Bailer (Teflon®)
___ Centrifugal Pump	X Bailer (PVC)	___ DDL Sampler	___ Bailer (Stainless Steel)
___ Submersible Pump	___ Bailer (Stainless Steel)	___ Dipper	___ Submersible Pump
___ Well Wizard™	___ Dedicated	___ Well Wizard™	___ Dedicated
Other: ___		Other: ___	

WELL INTEGRITY: OK | LOCK #: 2268

REMARKS: ___

Meter Calibration: Date: 7-30-92 Time: 1145 Meter Serial #: 4203 Temperature °F: ___

(EC 1000 ___ / ___) (DI ___) (pH 7 ___ / ___) (pH 10 ___ / ___) (pH 4 ___ / ___)

Location of previous calibration: A-2

Signature: [signature] Reviewed By: JS Page 4 of 15

WATER SAMPLE FIELD DATA SHEET

Rev. 2, 5/9

EMCON ASSOCIATES

PROJECT NO: G70-52.01 | SAMPLE ID: A-G (24)

PURGED BY: J. Williams | CLIENT NAME: BP OC 4931

SAMPLED BY: J. Williams | LOCATION: Oakland CA

TYPE: Ground Water ✓ Surface Water ___ Treatment Effluent ___ Other ___

CASING DIAMETER (inches): 2 ___ 3 ✓ 4 ___ 4.5 ___ 6 ___ Other ___

CASING ELEVATION (feet/MSL): N/R | VOLUME IN CASING (gal.): 5.32

DEPTH TO WATER (feet): 10.40 | CALCULATED PURGE (gal.): 26.60

DEPTH OF WELL (feet): 24.70 | ACTUAL PURGE VOL. (gal.): 27.00

DATE PURGED: 07-30-92 | Start (2400 Hr) 1310 | End (2400 Hr) 1332

DATE SAMPLED: 07-30-92 | Start (2400 Hr) 1336 | End (2400 Hr) 1377

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
1314	5.5	6.90	583	68.7	Brown	Heavy
1318	~~5.5~~ 11	6.72	591	66.5		
1324	16.5	6.72	596	66.2		
1327	22	6.72	540	66.3		
1332	27	6.74	590	65.4	↓	↓

D. O. (ppm): N/R | ODOR: None

N/R (COBALT 0 - 100) | N/R (NTU 0 - 200)

FIELD QC SAMPLES COLLECTED AT THIS WELL (i.e. FB-1, XDUP-1): N. A.

PURGING EQUIPMENT

- ___ 2" Bladder Pump
- ___ Centrifugal Pump
- ___ Submersible Pump
- ___ Well Wizard™
- ___ Bailer (Teflon®)
- ✓ Bailer (PVC)
- ___ Bailer (Stainless Steel)
- ___ Dedicated

Other: ___

SAMPLING EQUIPMENT

- ___ 2" Bladder Pump
- ___ DDL Sampler
- ___ Dipper
- ___ Well Wizard™
- ✓ Bailer (Teflon®)
- ___ Bailer (Stainless Steel)
- ___ Submersible Pump
- ___ Dedicated

Other: ___

WELL INTEGRITY: OK | LOCK #: 2005

REMARKS: ___

Meter Calibration: Date: 7-30-92 Time: 1014 Meter Serial #: 0203 Temperature °F: ___

(EC 1000 ___ / ___) (DI ___) (pH 7 ___ / ___) (pH 10 ___ / ___) (pH 4 ___ / ___)

Location of previous calibration: K-3

Signature: [signature] Reviewed By: [signature] Page 5 of 15

WATER SAMPLE FIELD DATA SHEET

Rev. 2, 5/91

EMCON ASSOCIATES

PROJECT NO: 6770-32.01 SAMPLE ID: A-7 (22)

PURGED BY: K REICHELDERFER CLIENT NAME: ARCO 4931

SAMPLED BY: ↓ LOCATION: 731 W. MacARTHUR BLVD., OAKLAND

TYPE: Ground Water X Surface Water ___ Treatment Effluent ___ Other ___

CASING DIAMETER (inches): 2 ___ 3 X 4 ___ 4.5 ___ 6 ___ Other ___

CASING ELEVATION (feet/MSL): NR VOLUME IN CASING (gal.): 4.76

DEPTH TO WATER (feet): 10.11 CALCULATED PURGE (gal.): 23.79

DEPTH OF WELL (feet): 22.9 ACTUAL PURGE VOL. (gal.): 19.50

DATE PURGED: 7-29-92 Start (2400 Hr) 1527 End (2400 Hr) 1540

DATE SAMPLED: 7-29-92 Start (2400 Hr) 1555 End (2400 Hr) 1557

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
1530	5.00	6.08	626	71.0	CLOUDY	LIGHT
1533	10.00	6.38	653	69.5		
1536	15.00	6.50	640	68.7		
1540	WELL DRIED @ 19.50 GALLONS					
1559	RECHARGE	6.66	651	69.4	↓	↓

D. O. (ppm): NR ODOR: SLIGHT

NR (COBALT 0 - 100) NR (NTU 0 - 200)

FIELD QC SAMPLES COLLECTED AT THIS WELL (i.e. FB-1, XDUP-1): NR

PURGING EQUIPMENT		SAMPLING EQUIPMENT	
___ 2" Bladder Pump	___ Bailer (Teflon®)	___ 2" Bladder Pump	X Bailer (Teflon®)
X Centrifugal Pump	___ Bailer (PVC)	___ DDL Sampler	___ Bailer (Stainless Steel)
___ Submersible Pump	___ Bailer (Stainless Steel)	___ Dipper	___ Submersible Pump
___ Well Wizard™	___ Dedicated	___ Well Wizard™	___ Dedicated
Other: ___		Other: ___	

WELL INTEGRITY: (GOOD) LOCK #: 2008

REMARKS: WELL DRIED @ 19.50 GALLONS (1540)

Meter Calibration: Date: 7-29-92 Time: 1525 Meter Serial #: 9203 Temperature °F: 79.9

(EC 1000 1012 / 1000) (DI ___) (pH 7 7.01 / 7.00) (pH 10 9.94 / 10.00) (pH 4 3.90 / ___)

Location of previous calibration: ___

Signature: [signature] Reviewed By: JB Page 6 of 15

WATER SAMPLE FIELD DATA SHEET

Rev. 2, 5/91

EMCON ASSOCIATES

PROJECT NO: 6170-32.01 SAMPLE ID: A-8

PURGED BY: S HORTON / K REICHELDERFER CLIENT NAME: ARCO 4931

SAMPLED BY: ↓ LOCATION: ~~7330~~ 731 W MacARTHUR BLVD, OAKLAND

TYPE: Ground Water X Surface Water ___ Treatment Effluent ___ Other ___

CASING DIAMETER (inches): 2 ___ 3 ___ 4 X 4.5 ___ 6 ___ Other ___

CASING ELEVATION (feet/MSL):	NR	VOLUME IN CASING (gal.):	NA
DEPTH TO WATER (feet):	11.33	CALCULATED PURGE (gal.):	NA
DEPTH OF WELL (feet):	20.1	ACTUAL PURGE VOL. (gal.):	NA

DATE PURGED: 7-29-92 Start (2400 Hr) N/A End (2400 Hr) N/A

DATE SAMPLED: ___ Start (2400 Hr) ___ End (2400 Hr) ___

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
—	PRODUCT IN WELL					

D. O. (ppm): ___ ODOR: ___ (COBALT 0 - 100) (NTU 0 - 200)

FIELD QC SAMPLES COLLECTED AT THIS WELL (i.e. FB-1, XDUP-1): NA

PURGING EQUIPMENT		SAMPLING EQUIPMENT	
___ 2" Bladder Pump	___ Bailer (Teflon®)	___ 2" Bladder Pump	___ Bailer (Teflon®)
___ Centrifugal Pump	___ Bailer (PVC)	___ ODL Sampler	___ Bailer (Stainless Steel)
___ Submersible Pump	___ Bailer (Stainless Steel)	___ Dipper	___ Submersible Pump
___ Well Wizard™	___ Dedicated	___ Well Wizard™	___ Dedicated
Other: NA		Other: NA	

WELL INTEGRITY: ___ LOCK #: ___

REMARKS: MMC DIDN'T DETECT PRODUCT, YET 10 mLs IN BAILER (@ 55')

Meter Calibration: Date: ___ Time: ___ Meter Serial #: ___ Temperature °F: ___

(EC 1000 ___ / ___) (DI ___) (pH 7 ___ / ___) (pH 10 ___ / ___) (pH 4 ___ / ___)

Location of previous calibration: ___

Signature: [signature] Reviewed By: [signature] Page 7 of 15

WATER SAMPLE FIELD DATA SHEET

Rev. 2, 5/91

EMCON ASSOCIATES

PROJECT NO: G70-3.2.01 | SAMPLE ID: ~~TBC~~ A-9 (38.5)

PURGED BY: K REICHLDORFER | CLIENT NAME: ARCO 4931

SAMPLED BY: ↓ | LOCATION: 731 W MacARTHUR BLVD, OAKLAND

TYPE: Ground Water X Surface Water ___ Treatment Effluent ___ Other ___

CASING DIAMETER (inches): 2 ___ 3 ___ 4 ___ 4.5 ___ 6 X Other ___

CASING ELEVATION (feet/MSL):	NR	VOLUME IN CASING (gal.):	41.29
DEPTH TO WATER (feet):	16.47	CALCULATED PURGE (gal.):	206.47
DEPTH OF WELL (feet):	38.6	ACTUAL PURGE VOL. (gal.):	206.50

DATE PURGED: 7-30-92 Start (2400 Hr) 1400 End (2400 Hr) 1426

DATE SAMPLED: 7-30-92 Start (2400 Hr) 1440 End (2400 Hr) 1442

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
1407	41.50	7.11	667	66.0	CLOUDY	LIGHT
1412	83.00	6.78	663	66.2	↓	↓
1417	124.50	6.70	658	65.9	↓	↓
1422	166.00	6.71	657	65.9	CLEAR	MINIMAL
1426	206.50	6.72	657	65.9	↓	↓

D. O. (ppm): NR ODOR: NONE

NR (COBALT 0 - 100) MINIMAL (NTU 0 - 200)

FIELD QC SAMPLES COLLECTED AT THIS WELL (i.e. FB-1, XDUP-1): NR

PURGING EQUIPMENT		SAMPLING EQUIPMENT	
___ 2" Bladder Pump	___ Bailer (Teflon®)	___ 2" Bladder Pump	X Bailer (Teflon®)
X Centrifugal Pump	___ Bailer (PVC)	___ DDL Sampler	___ Bailer (Stainless Steel)
___ Submersible Pump	___ Bailer (Stainless Steel)	___ Dipper	___ Submersible Pump
___ Well Wizard™	___ Dedicated	___ Well Wizard™	___ Dedicated
Other: ___		Other: ___	

WELL INTEGRITY: OK LOCK #: NO ~~226.5~~ 3263

REMARKS: PUT NEW EMCON LOCK ON

Meter Calibration: Date: 7-30-92 Time: 1045 Meter Serial #: 9203 Temperature °F: ___

(EC 1000 ___ / ___) (DI ___) (pH 7 ___ / ___) (pH 10 ___ / ___) (pH 4 ___ / ___)

Location of previous calibration: A-2

Signature: [signature] Reviewed By: JTS Page 5 of 15

WATER SAMPLE FIELD DATA SHEET

Rev. 2, 5/91

EMCON ASSOCIATES

PROJECT NO: G7C-32.01 SAMPLE ID: A-1CC3C)

PURGED BY: S. Horton CLIENT NAME: ARCC #4931

SAMPLED BY: S. Horton LOCATION: Oakland, CA

TYPE: Ground Water X Surface Water ___ Treatment Effluent ___ Other ___

CASING DIAMETER (inches): 2 ___ 3 X 4 ___ 4.5 ___ 6 ___ Other ___

CASING ELEVATION (feet/MSL): - VOLUME IN CASING (gal.): 6.82

DEPTH TO WATER (feet): 11.84 CALCULATED PURGE (gal.): 34.14

DEPTH OF WELL (feet): 36.20 ACTUAL PURGE VOL. (gal.): 35.00

DATE PURGED: 7/24/97 Start (2400 Hr) 15:33 End (2400 Hr) 15:45

DATE SAMPLED: 7/24/97 Start (2400 Hr) 15:49 End (2400 Hr) 15:56

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
15:36	7	6.91	649	73.5	brown	heavy
15:38	14	6.72	623	69.4	brown	heavy
15:40	21	6.70	607	67.5	brown	heavy
15:43	28	6.85	602	66.5	brown	heavy
15:45	35	6.82	602	66.5	brown	heavy

D. O. (ppm): NR ODOR: slight

COLOR: NR (COBALT 0 - 100)* TURBIDITY: NR (NTU 0 - 200)

FIELD QC SAMPLES COLLECTED AT THIS WELL (i.e. FB-1, XDUP-1): NR

PURGING EQUIPMENT		SAMPLING EQUIPMENT	
___ 2" Bladder Pump	___ Bailer (Teflon®)	___ 2" Bladder Pump	X Bailer (Teflon®)
X Centrifugal Pump	___ Bailer (PVC)	___ DDL Sampler	___ Bailer (Stainless Steel)
___ Submersible Pump	___ Bailer (Stainless Steel)	___ Dipper	___ Submersible Pump
___ Well Wizard™	___ Dedicated	___ Well Wizard™	___ Dedicated
Other: ___		Other: ___	

WELL INTEGRITY: Good LOCK #: 2265

REMARKS: ___

Meter Calibration: Date: 7/24/97 Time: ___ Meter Serial #: 2912 Temperature °F: ___

(EC 1000 ___ / ___) (DI ___) (pH 7 ___ / ___) (pH 10 ___ / ___) (pH 4 ___ / ___)

Location of previous calibration: A-13

Signature: [signature] Reviewed By: JD Page 9 of 15

WATER SAMPLE FIELD DATA SHEET

Rev. 2, 5/9

EMCON ASSOCIATES

PROJECT NO: 670-3201 SAMPLE ID: A-11 (28)

PURGED BY: J. Williams CLIENT NAME: ARCO 4921

SAMPLED BY: J. Williams LOCATION: 731 N. MacArthur Blvd Oakland CA

TYPE: Ground Water ✓ Surface Water ___ Treatment Effluent ___ Other ___

CASING DIAMETER (inches): 2 ___ 3 ✓ 4 ___ 4.5 ___ 6 ___ Other ___

CASING ELEVATION (feet/MSL): NR VOLUME IN CASING (gal.): 6.26

DEPTH TO WATER (feet): 11.33 CALCULATED PURGE (gal.): 31.01

DEPTH OF WELL (feet): 28.0 ACTUAL PURGE VOL. (gal.): 32.00

DATE PURGED: 07-30-92 Start (2400 Hr) 1125 End (2400 Hr) 1140

DATE SAMPLED: 07-30-92 Start (2400 Hr) 1145 End (2400 Hr) 1148

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
1130	6.50	7.11	664	68.2	BROWN	HEAVY
1132	~~6.84~~ 13.00	6.84	654	68.1		
1135	19.50	6.73	652	67.9		
1137	26.00	6.83	653	67.9		
1140	32.00	6.78	652	67.8	↓	↓

D. O. (ppm): NR ODOR: NONE

NR (COBALT 0 - 100) HEAVY (NTU 0 - 200)

FIELD QC SAMPLES COLLECTED AT THIS WELL (i.e. FB-1, XDUP-1): NR

PURGING EQUIPMENT

___ 2" Bladder Pump ___ Bailer (Teflon®)

___ Centrifugal Pump X Bailer (PVC)

___ Submersible Pump ___ Bailer (Stainless Steel)

___ Well Wizard™ ___ Dedicated

Other: ___

SAMPLING EQUIPMENT

___ 2" Bladder Pump X Bailer (Teflon®)

___ DDL Sampler ___ Bailer (Stainless Steel)

___ Dipper ___ Submersible Pump

___ Well Wizard™ ___ Dedicated

Other: ___

WELL INTEGRITY: OK LOCK #: 2005

REMARKS: ___

Meter Calibration: Date: 7-30-92 Time: 1045 Meter Serial #: 9203 Temperature °F: ___

(EC 1000 ___ / ___) (DI ___) (pH 7 ___ / ___) (pH 10 ___ / ___) (pH 4 ___ / ___)

Location of previous calibration: A-2

Signature: Lisa Fiedler Reviewed By: ___ Page 1 of 1

WATER SAMPLE FIELD DATA SHEET

Rev. 2, 5/91

EMCON ASSOCIATES

PROJECT NO: 670-32.01 SAMPLE ID: A-12 (28)

PURGED BY: J Williams CLIENT NAME: ARCO 4921

SAMPLED BY: J Williams LOCATION: 23. W MACARTHUR BLVD OAKLAND CA

TYPE: Ground Water ✓ Surface Water ___ Treatment Effluent ___ Other ___

CASING DIAMETER (inches): 2 ___ 3 ✓ 4 ___ 4.5 ___ 6 ___ Other ___

CASING ELEVATION (feet/MSL): NC VOLUME IN CASING (gal.): 6.73

DEPTH TO WATER (feet): 10.81 CALCULATED PURGE (gal.): 33.65

DEPTH OF WELL (feet): 28.9 ACTUAL PURGE VOL. (gal.): 34.00

DATE PURGED: 07-30-97 Start (2400 Hr) 1156 End (2400 Hr) 1212

DATE SAMPLED: 07-30-97 Start (2400 Hr) 1218 End (2400 Hr) 1220

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
1200	7.00	7.15	634	69.6	BROWN	HEAVY
1203	14.00	6.89	646	68.3		
1205	21.00	6.80	640	68.1		
1209	28.00	6.78	640	68.0		
1212	34.00	6.80	636	67.7	↓	↓
					NR	HEAVY
					(COBALT 0 - 100)	(NTU 0 - 200)

D. O. (ppm): NR ODOR: SLIGHT

FIELD QC SAMPLES COLLECTED AT THIS WELL (i.e. FB-1, XDUP-1): NR

PURGING EQUIPMENT		SAMPLING EQUIPMENT	
___ 2" Bladder Pump	___ Bailer (Teflon®)	___ 2" Bladder Pump	X Bailer (Teflon®)
___ Centrifugal Pump	X Bailer (PVC)	___ DDL Sampler	___ Bailer (Stainless Steel)
___ Submersible Pump	___ Bailer (Stainless Steel)	___ Dipper	___ Submersible Pump
___ Well Wizard™	___ Dedicated	___ Well Wizard™	___ Dedicated
Other: ___		Other: ___	

WELL INTEGRITY: OK LOCK #: 2268

REMARKS: ___

Meter Calibration: Date: 7-30-97 Time: 1045 Meter Serial #: 4203 Temperature °F: ___

(EC 1000 ___ / ___) (DI ___) (pH 7 ___ / ___) (pH 10 ___ / ___) (pH 4 ___ / ___)

Location of previous calibration: A-2

Signature: [signature] Reviewed By: JG Page 11 of 12

WATER SAMPLE FIELD DATA SHEET

Rev. 2, 5/91

EMCON ASSOCIATES

PROJECT NO: G70-32.01 SAMPLE ID: A-13 (29)

PURGED BY: S. Horton CLIENT NAME: ARCO #4951

SAMPLED BY: S. Horton LOCATION: Oakland, CA

TYPE: Ground Water X Surface Water ___ Treatment Effluent ___ Other ___

CASING DIAMETER (inches): 2 ___ 3 X 4 ___ 4.5 ___ 6 ___ Other ___

CASING ELEVATION (feet/MSL): - VOLUME IN CASING (gal.): 6.796

DEPTH TO WATER (feet): 11.13 CALCULATED PURGE (gal.): 33.98

DEPTH OF WELL (feet): 29.40 ACTUAL PURGE VOL. (gal.): 34.00

DATE PURGED: 7/29/92 Start (2400 Hr) 14:46 End (2400 Hr) 15:03

DATE SAMPLED: 7/29/92 Start (2400 Hr) 15:09 End (2400 Hr) 15:10

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
14:49	7.0	6.52	691	69.3	cloudy	slight
14:52	14.0	6.65	705	69.4	brown	moderate
14:54	21.0	6.67	712	69.4	brown	moderate
15:01	27.5	6.79	723	69.8	brown	heavy
15:03	34.0	6.77	736	69.8	brown	heavy

D. O. (ppm): NR ODOR: slight

COLOR: NR (COBALT 0 - 100) TURBIDITY: NR (NTU 0 - 200)

FIELD QC SAMPLES COLLECTED AT THIS WELL (i.e. FB-1, XDUP-1): NR

PURGING EQUIPMENT		SAMPLING EQUIPMENT	
___ 2" Bladder Pump	___ Bailer (Teflon®)	___ 2" Bladder Pump	X Bailer (Teflon®)
X Centrifugal Pump	___ Bailer (PVC)	___ DDL Sampler	___ Bailer (Stainless Steel)
___ Submersible Pump	___ Bailer (Stainless Steel)	___ Dipper	___ Submersible Pump
___ Well Wizard™	___ Dedicated	___ Well Wizard™	___ Dedicated
Other: ___		Other: ___	

WELL INTEGRITY: Good LOCK #: 2268

REMARKS: ___

Meter Calibration: Date: 7/29/92 Time: 14:[illegible] Meter Serial #: 8913 Temperature °F: 7/29/92 15:42 72.4

(EC 1000 Std / 1000) (DI ___) (pH 7 [illegible] / 7.00) (pH 10 9.91 / 10.00) (pH 4 4.01 / ___)

Location of previous calibration: ___

Signature: [signature] Reviewed By: [signature] Page 12 of 15

WATER SAMPLE FIELD DATA SHEET

Rev. 2, 5/91

EMCON ASSOCIATES

PROJECT NO: 970-32.01 SAMPLE ID: AR-1 (30)

PURGED BY: K REICHELDERFER CLIENT NAME: ARCO 4931

SAMPLED BY: ↓ LOCATION: 731 N MacARTHUR BLVD., OAKLAND

TYPE: Ground Water X Surface Water ___ Treatment Effluent ___ Other ___

CASING DIAMETER (inches): 2 ___ 3 ___ 4 ___ 4.5 ___ 6 X Other ___

CASING ELEVATION (feet/MSL): NR VOLUME IN CASING (gal.): 27.72

DEPTH TO WATER (feet): 11.32 CALCULATED PURGE (gal.): 138.58

DEPTH OF WELL (feet): 30.2 ACTUAL PURGE VOL. (gal.): 76.66

DATE PURGED: 7-29-92 Start (2400 Hr) 1205 End (2400 Hr) 1237

DATE SAMPLED: 7-29-92 Start (2400 Hr) 1252 End (2400 Hr) 1255

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
1211	28.00	7.12	859	66.7	LT BROWN	MODERATE
1224	56.00	6.95	759	66.4	BROWN	HEAVY
1237	WELL DRIED @		76.00 GALLONS			
1257	RECHARGE	6.83	736	65.4	CLOUDY	MODERATE

D. O. (ppm): NR ODOR: SLIGHT

COLOR (visual): NR (COBALT 0 - 100)

TURBIDITY (visual): MODERATE (NTU 0 - 200)

FIELD QC SAMPLES COLLECTED AT THIS WELL (i.e. FB-1, XDUP-1): NR

PURGING EQUIPMENT		SAMPLING EQUIPMENT	
___ 2" Bladder Pump	___ Bailer (Teflon®)	___ 2" Bladder Pump	X Bailer (Teflon®)
X Centrifugal Pump	___ Bailer (PVC)	___ DDL Sampler	___ Bailer (Stainless Steel)
___ Submersible Pump	___ Bailer (Stainless Steel)	___ Dipper	___ Submersible Pump
___ Well Wizard™	___ Dedicated	___ Well Wizard™	___ Dedicated
Other: ___		Other: ___	

WELL INTEGRITY: GOOD LOCK #: 2008

REMARKS: WELL DRIED @ 76 CO GALLONS (1237 WL - 29.W)
WL 1252 26.81

Meter Calibration: Date: 7-29-92 Time: 1125 Meter Serial #: 9203 Temperature °F: ___

(EC 1000 ___ / ___) (DI ___) (pH 7 ___ / ___) (pH 10 ___ / ___) (pH 4 ___ / ___)

Location of previous calibration: A-2

Signature: Kristin Reichelderfer Reviewed By: JTS Page 15 of 15

WATER SAMPLE FIELD DATA SHEET

Rev. 2, 5/91

EMCON ASSOCIATES

PROJECT NO: G70-32.01 SAMPLE ID: AR-2 (27)

PURGED BY: K REICHELDERFER CLIENT NAME: ARCO 4931

SAMPLED BY: ↓ LOCATION: 731 W. MacARTHUR BL OAKLAND

TYPE: Ground Water X Surface Water ___ Treatment Effluent ___ Other ___

CASING DIAMETER (inches): 2 ___ 3 ___ 4 ___ 4.5 ___ 6 X Other ___

CASING ELEVATION (feet/MSL): NR VOLUME IN CASING (gal.): 22.87

DEPTH TO WATER (feet): 11.92 CALCULATED PURGE (gal.): 114.36

DEPTH OF WELL (feet): 27.5 ACTUAL PURGE VOL. (gal.): 115.00

DATE PURGED: 7-29-92 Start (2400 Hr) 1325 End (2400 Hr) 1353

DATE SAMPLED: 7-29-92 Start (2400 Hr) 1355 End (2400 Hr) 1357

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
1330	23.00	7.30	564	67.4	BROWN	HEAVY
1335	46.00	7.05	611	66.2	↓	↓
1343	69.00	6.98	638	65.9	↓	↓
1348	92.00	6.93	648	65.8	CLOUDY	LIGHT
1353	115.00	6.90	651	65.7	↓	↓

D. O. (ppm): NR ODOR: SLIGHT NR (COBALT 0 - 100) LIGHT (NTU 0 - 200)

FIELD QC SAMPLES COLLECTED AT THIS WELL (i.e. FB-1, XDUP-1): NR

PURGING EQUIPMENT		SAMPLING EQUIPMENT	
___ 2" Bladder Pump	___ Bailer (Teflon®)	___ 2" Bladder Pump	X Bailer (Teflon®)
X Centrifugal Pump	___ Bailer (PVC)	___ DDL Sampler	___ Bailer (Stainless Steel)
___ Submersible Pump	___ Bailer (Stainless Steel)	___ Dipper	___ Submersible Pump
___ Well Wizard™	___ Dedicated	___ Well Wizard™	___ Dedicated
Other: ___		Other: ___	

WELL INTEGRITY: GOOD LOCK #: 2268

REMARKS: ___

Meter Calibration: Date: 7-29-92 Time: 1125 Meter Serial #: 9203 Temperature °F: ___

(EC 1000 ___ / ___) (DI ___) (pH 7 ___ / ___) (pH 10 ___ / ___) (pH 4 ___ / ___)

Location of previous calibration: 4-2

Signature: [signature] Reviewed By: JB Page 14 of 15

WATER SAMPLE FIELD DATA SHEET

Rev. 2, 5/91

EMCON ASSOCIATES

PROJECT NO: 7470-32.01 SAMPLE ID: AR-3 (29)

PURGED BY: K REICHELDERFER CLIENT NAME: ARCO #4931

SAMPLED BY: ↓ LOCATION: 731 W. MacARTHUR BL OAKLAND, CA

TYPE: Ground Water X Surface Water ___ Treatment Effluent ___ Other ___

CASING DIAMETER (inches): 2 ___ 3 ___ 4 X 4.5 ___ 6 ___ Other ___

CASING ELEVATION (feet/MSL): NR VOLUME IN CASING (gal.): 12.02

DEPTH TO WATER (feet): 11.57 CALCULATED PURGE (gal.): 60.12

DEPTH OF WELL (feet): 29.4 ACTUAL PURGE VOL. (gal.): 61.00

DATE PURGED: 7-29-92 Start (2400 Hr) 1418 End (2400 Hr) 1435

DATE SAMPLED: 7-29-92 Start (2400 Hr) 1450 End (2400 Hr) 1452

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
1421	12.50	7.09	703	67.8	LT BROWN	MODERATE
1424	25.00	6.86	675	66.8	↓	↓
1429	37.50	6.74	676	66.0	CLOUDY	LIGHT
1432	50.00	6.70	671	65.8	|	|
1435	61.00	6.71	668	65.6	↓	↓

D. O. (ppm): NR ODOR: NONE

COLOR (visual): NR (COBALT 0 - 100)

TURBIDITY (visual): LIGHT (NTU 0 - 200)

FIELD QC SAMPLES COLLECTED AT THIS WELL (i.e. FB-1, XDUP-1): NR

PURGING EQUIPMENT		SAMPLING EQUIPMENT	
___ 2" Bladder Pump	___ Bailer (Teflon®)	___ 2" Bladder Pump	X Bailer (Teflon®)
X Centrifugal Pump	___ Bailer (PVC)	___ DDL Sampler	___ Bailer (Stainless Steel)
___ Submersible Pump	___ Bailer (Stainless Steel)	___ Dipper	___ Submersible Pump
___ Well Wizard™	___ Dedicated	___ Well Wizard™	___ Dedicated
Other: ___		Other: ___	

WELL INTEGRITY: GOOD LOCK #: 2005

REMARKS: REPLACED 4" L.W.C.

Meter Calibration: Date: 7-29-92 Time: 11:25 Meter Serial #: 93203 Temperature °F: ___

(EC 1000 ___ / ___) (DI ___) (pH 7 ___ / ___) (pH 10 ___ / ___) (pH 4 ___ / ___)

Location of previous calibration: ___

Signature: [signature] Reviewed By: JS Page 15 of 15

APPENDIX F

GETTLER-RYAN INC. DAILY REPORTS

Gettler - Ryan Inc.
GENERAL CONTRACTORS

TAGS

DAILY REPORT

FORMS

COMPANY Arco #4931 JOB NO. 9909.11

LOCATION 731 MacArthur / West DATE 7-29-92
Oakland CA

JOB INSTRUCTIONS: To sit in unstuck ~~[illegible]~~ A-6 ~~[illegible]~~ which was ~~[illegible]~~ stuck due to gauging ~~[illegible]~~ activities onsite.

WORK PERFORMED (CONT. ON REVERSE SIDE): Pull Skimmer from well and found ~ 1.5' of product in skimmer emptied into existing drum which is now located in trash enclosure. Replaced skimmer in well

~ 1 quart of product recovered.

MATERIALS:

SUBCONTRACTOR:

EQUIPMENT

AIR COMPRESSOR		PAVING ROLLER		VR3	
SPECIALTY TRUCK	30-05(1)	PAVING WACKER		OVA	
PIPE TRUCK & TOOLS		CONCRETE MIXER		OVM	
DUMP TRUCK		CONCRETE SAWING		GASTECH	
LOADER		SIGNS		SAMPLE PUMP	
STEAM CLEANER		CONES		HORIBA	
WATER/TRANSFER PUMP		ARROW BOARD		PETROTITE-TESTER	
GENERATOR		TRENCH PLATES		FLOW TESTER	

FOREMAN

Gettler - Ryan Inc.
GENERAL CONTRACTORS

TAGS

DAILY REPORT

FORMS

COMPANY Arco Products Co 4931 JOB NO. 9909.08

LOCATION 731 Mac Arthur / West DATE 9-14-92
Oakland CA

JOB INSTRUCTIONS: To site to check Auto Bailer

WORK PERFORMED (CONT. ON REVERSE SIDE): Pulled auto Bailer
~~Fro~~ found no product in bailer. checked well
with Standard Bailer found .35' of product.
Upon investigation water levels have dropped ≈
1' from point where Bailer orginally set.
Bailed off floating product. Reinstalled Bailer
1' lower Put product in drum onsite
for product.

Bailed ≈ 0.5 gals of product water mix 75% product
Due to probe failure unable to get accurate water level

MATERIALS: water @ ≈ 12'

SUBCONTRACTOR:

EQUIPMENT

AIR COMPRESSOR		PAVING ROLLER		VR3	
SPECIALTY TRUCK	30-05	PAVING WACKER		OVA	
PIPE TRUCK & TOOLS		CONCRETE MIXER		OVM	
DUMP TRUCK		CONCRETE SAWING		GASTECH	
LOADER		SIGNS		SAMPLE PUMP	
STEAM CLEANER		CONES		HORIBA	
WATER/TRANSFER PUMP		ARROW BOARD		PETROTITE-TESTER	
GENERATOR		TRENCH PLATES		FLOW TESTER	

FOREMAN